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Nursery Guide

For Mothers
and Nurses

By
LEONA W. SMOCK, M.A., M.D.

Illustrated

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NURSERY GUIDE

NURSERY GUIDE

FOR
MOTHERS AND NURSES

BY

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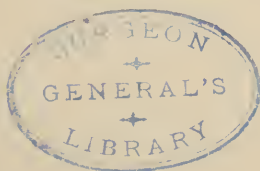
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1923



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PREFACE

The care, nourishment, and ills of infants are so different from those of children and adults that they deserve special consideration. The person in charge of an infant has unparalleled responsibility, for to her is entrusted the progeny of our race. Through providing proper care and nourishment, the ills of infancy are greatly reduced. Food, more than any of the other factors of selection, determines which child shall live. Babies fed food other than mother's milk as a rule are greatly handicapped in the struggle for existence.

Although epoch-making discoveries have been made in the science of infant feeding during the past two decades, a high infant mortality rate continues. Through the efforts of scientific investigators, physicians, departments of health, nurses, and mothers, a decrease in the infant death rate is evident, but much still remains to be done.

This brief nursery guide is intended to aid those to whom are entrusted the care and feeding of infants.

LOUIS W. SAUER.

Evanston, Illinois, 1923.

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NURSERY GUIDE

CHAPTER I

GENERAL CARE AND DEVELOPMENT

Although the general health of the parents is not so intimately related to the ills of infancy as to those of later life, three diseases deserve mention.

1. *Tuberculosis* is not inherited, but acquired some time before or after birth. The infant, in contaminated surroundings, inhales the germs or takes them in the food. Parents with active tuberculosis must not expose their offspring. Infants born of such mothers should be taken out of surroundings that endanger their health. Over seventy per cent of all children past the fourteenth year give a positive tuberculin test—proof that a tuberculous infection exists or has existed. The earlier the infection occurs, the more likely will it be severe.

2. *Syphilis*. Where successive miscarriages occur without an apparent cause, a Wassermann blood examination is essential. Modern methods of treating this serious dis-

ease practically cure cases that have not been too long neglected, so that normal children can result. Infants born with this taint should be treated early.

3. *Gonorrhea*. This highly contagious disease is the most frequent cause of blindness in the newly born. Because of the rapidity of its spread, the eyes of the babe need very careful watching. A vaginal discharge of mother or child should always be examined microscopically to exclude this contagious disease. (See Vaginitis, page 132.)

Prenatal Care

Date of Confinement

By reckoning back three calendar months from the beginning of the last menstrual period and then adding seven days, the approximate date of confinement can be determined. For example, if the date of the beginning of the last menstruation was July first, the confinement may be expected about the eighth of the following April.

Instructions During Pregnancy

1. Outdoor exercise should be encouraged, but fatigue must be avoided. Golf is permissible, but tennis, skating, horseback riding, swimming, and motoring over rough roads are hazardous. An afternoon nap should be taken daily.

2. The diet should consist of plain, not highly seasoned food; milk and cocoa are much better than tea or coffee. The diet should be more or less restricted during the last month.

3. The pelvic measurements should be made by the physician at least two months before the first delivery.

4. An 8 oz. bottle of urine should be sent to the physician on the first of every month, and during the last two months at least every two weeks. The bowels should not be allowed to become constipated.

5. If the confinement is to take place at home, all supplies should be on hand at least six weeks before the expected date. This outfit should include: several pounds of sterile cotton, 25 yards of sterile gauze, 4 rolls of cotton batting, 2 yards of heavy muslin for abdominal binders, a dozen diapers or old towels, several old sheets, a quart of grain alcohol, vaseline, tape, douche pan, basins, pitchers, rubber sheeting, fountain syringe, drinking tubes, medicine droppers, and several dozen large safety pins.

General Care

The responsibility of birth registration in the archives of the state rests with the obstetrician. In case of doubt, inquiry may be

**Birth
Registration**

directed to the bureau of birth registration of the department of health at the state capital.

The modern maternity hospital offers ideal conditions for confinement.

Oil Bath

After the cord has been cut a sterile dressing is applied, $\frac{1}{2}$ per cent silver nitrate solution or 10 per cent argyrol solution is dropped into the eyes by the attendant, and the infant, wrapped in a few diapers and blanket, is taken to the nursery where he gets his first bath. This usually consists of oil. In fact, the oil bath is usually continued daily until the cord is off and the navel healed. The temperature of the bath room should be 85° to 90° F.

The infant's rectal temperature should be taken daily before the bath for the first two weeks. (See Taking Temperature, page 148.) Boiled, warm water is given every four hours, beginning four hours after birth, until the baby is twenty-four hours old, when feeding at the breast begins. After this, water may be given several times a day.

Minor Ailments of the Newly Born

Pus in the eyes, soreness of the navel, or rise in temperature must be reported to the physician. Jaundice of the newly born is

usually transient. Pustules or vesicles (blisters) are obstinate when they occur, and need immediate attention. Swollen breasts of the newly born should be let alone, as manipulation may cause infection. Swellings about the scalp usually disappear in the course of days or weeks. Faint birth-marks about the eyes, forehead, or nape of the neck usually disappear during the first year. The dark red or purple ones, on the other hand, are more permanent, getting larger as the child grows older. They may often be caused to disappear if treated before the end of the first year.

Nursery assistance has disadvantages as well as advantages. A person applying for the position of nursemaid should preferably have had experience, and should be willing to bring a recent certificate of health from her physician. Her uniforms should be clean and washable; her room should adjoin the nursery; she must take instructions from the mother.

Nursemaid

The nursery should be isolated, light, and easily ventilated. It is preferable to have the walls painted some light color; there should be no pictures or unnecessary curtains. If there are any rugs, they should be cleaned frequently. Sunlight should

Nursery

enter the room several hours each day. Dark shades are indispensable, as there should be no bright light in the nursery while the baby sleeps. Electric bulbs which can be dimmed are convenient. It is usually impossible to give the baby sufficient privacy in a room occupied by other members of the family.

Crib

Cribs are indispensable for premature infants, and other babies may be kept in them until they begin to sit up.

Bed

The bed should be plain enameled iron, brass, or wood, with woven iron springs. One side of the bed should be sliding. A four-inch, loose hair mattress is placed on the wire springs, then a rubber sheet, a draw-sheet, and a plain sheet. Pillows are seldom necessary. If the room temperature gets below 65° F. it is safest to cover the infant with a sheet, then a thin quilted pad or woolen blanket, and over this another sheet. A double set of bedding permits one set to be aired while the other is in use. It is advisable to turn the mattress from day to day. If during cold weather hot water bottles or electric heating pads are used for prematurely born infants, care should be exercised to avoid

burns. The water in hot water bottles should never be above 110° F.

A nursery medicine chest is convenient. It should contain ground mustard, powdered borie acid, mineral oil, castor oil, milk of magnesia, peroxide of hydrogen, adhesive plaster, cotton, bandages, spoons, medicine glass, tweezers, and scissors. Poisons such as bichloride of mercury, lysol, tincture of iodine, and carbolic acid should never be kept in the nursery. These should be locked in a special poison chest in another room out of reach of children. The mother should have sole access to them, and supervise their administration and disposal.

**Medicine
Chest**

Clothing

A well-equipped wardrobe varies somewhat according to the season. It should contain:

Wardrobe

- 3 to 6 half-wool, double-breasted undershirts (second size);
- 3 to 6 cotton or silk undershirts or bands (for hot weather use only);
- 6 outing flannel or stockinette nightgowns (with drawstrings);
- 6 white cotton slips;
- 3 flannel, 3 cotton or linen petticoats;
- 3 or more pairs of white silk or cotton hose;

2 or more dozen canton flannel napkins
(20 x 40 inches);

4 dozen bird's eye cotton napkins (same
size);

Also 2 jackets, 1 cloak, 1 cap, 1 veil, mit-
tens, and 2 crib blankets.

(Complete outfits can be obtained at de-
partment stores.)

**Excess
Clothing**

Most young babies are overclothed. As infants perspire and become restless when overclothed, excess of clothing must be avoided, even during cool weather. Infants cannot regulate their body temperature as well as older children. The coldest days out of doors are often the hottest in the nursery. Clothes should be loose and suspended from the shoulders. If the napkin is pinned too tightly, the feet are apt to be cold from lack of proper circulation. Young infants should be dressed with care, and turned as little as possible while being dressed.

**Indoor
Clothing
In Winter**

If the temperature of the nursery gets below 50° F. at any time during the twenty-four hours, it is advisable to use the double-breasted undershirt. Should the room temperature get down to freezing, or should the baby get an airing during cool weather, the band, petticoat and stockings may also be

used, and the sleeves of the gown should be pulled down over the hands. Feet and hands should never feel cold. The night-gown can be worn during the day as well as at night—at least for the first few months. Sleeping bags may be used for older infants. They should so include the body that exposure and the danger of suffocation are entirely eliminated.

The clothing worn should be in accord with the temperature to which the child is exposed. In the late spring and early autumn it is sometimes necessary to add or remove garments and covers several times a day. During the heat of a summer day, the infant is best off with only a diaper and band, and on hot nights a thin, loose cotton slip may be added. Excess of clothing and covers must be avoided at all times. Electric fans should not blow directly on the baby, but should keep the air in motion and thereby improve ventilation.

After the undershirt has been put on, the napkin is adjusted. Care must be taken that it is smooth and free from wrinkles. It is not advisable to put a small folded diaper inside the triangularly folded one. Soft pads may be pinned to the inside of

**Indoor
Clothing
In Summer**

**Napkin
(Diaper)**

the dress or nightgown, whereby the linen is protected.

The normal infant urinates between twenty and thirty times in twenty-four hours, the more frequently the more he is awake. During the day the napkin should be changed whenever it is wet or soiled; at night, when the baby is taken up to be fed. The urine should be pale and free from odor. The so-called ammoniacal diaper—the kind that chafes the infant—is not infrequently the result of poor hygiene. It is now known that a germ, found in insufficiently boiled napkins, decomposes the urine shortly after it is passed, and that the strong odor is the result of such decomposition. If the infant becomes chafed, the napkin should be left off for several hours each day. All used napkins should be boiled for fifteen minutes and dried in the sun when the weather permits. Soda, lye, and washing powders should not be used. Rubber or waterproof diapers worn over the regular napkin may do more harm than good. They keep the clothing clean, but often cause the buttocks to become chafed. They are suitable only for temporary use when out of doors. Paper napkins of the proper texture and permeability are practical while traveling.

Rompers are practical when the child has reached the run-about age, and has fairly good bladder control. Socks may be worn during warm weather, but must be discontinued when it begins to get cold; a mother may be exposing her child to unnecessary dangers in the hope of "hardening" him. Stockings are much safer than socks. The first pair of shoes should be soft-soled and may be worn when the infant begins to stand. When the child begins to walk, the sole must be somewhat thicker. Well fitting lace-shoes give more ankle support than do button-shoes. Shoes should be sufficiently large and broad. Overshoes and leg-gings should be worn on cold as well as on damp days by infants old enough to walk.

**Other
Clothing**

Bowels

The healthy, breast-fed infant usually has one to three orange-colored stools in twenty-four hours. If he is given too much food or kept too warm, there may be four to six a day, which may contain white curds and mucus, or may be green and foamy. Some breast-fed infants who are thriving may have infrequent bowel movements (one normal stool every two or three days). Mothers often worry needlessly about this. These

Bowels

healthy infants are utilizing the food so completely that the amount of waste is minimal; this is not constipation. The consistency of the stools rather than the frequency, determines constipation. In case of constipation, a soap, glycerin, or gluten suppository may be used, and if without result may be repeated in twelve hours. In very obstinate cases a few ounces of sweetened oatmeal water may be fed several times a day. Enemas often make constipation worse. The buttocks should be cleansed with soap and water after each bowel movement.

Commode

When the child can sit alone, the commode should be used daily before the bath. Regularity should be taught early. If necessary, a suppository may be resorted to. In the course of a few weeks most infants acquire the habit of a daily evacuation of the bowel before the bath.

Bath

The full tub bath may be given as soon as the navel has entirely healed. The best time to bathe the young infant is in the morning before the second meal, that is, between nine and ten o'clock. Infants past eighteen months should be bathed before

the evening meal. The room should be warm, but overheating and drafts must be avoided. An electric heater, a small gas or oil stove may be necessary. The temperature of the bath water should be that of the body and is best determined just before the child is placed in it. As bath thermometers often get out of order, dipping the elbow into the water will test the temperature with sufficient accuracy. The bath should be about 95° F. until the beginning of the sixth month; from then until one year, 90° F.; during the second year about 85° F. Delicate children are sometimes better off with only one or two baths a week. An infant with a cold, cough, or skin disease should not be bathed without the physician's consent.

After everything necessary for the bath is at hand, the infant is undressed and covered with a towel. After the face has been washed with plain water, the genitals, extremities, trunk, and scalp are lathered with a soft cloth. The child is then placed in the tub, the neck and shoulders resting on the palm of the mother's hand. After rinsing he is placed on the dressing table or lap and gently dried with a soft towel. Stearate of zinc or corn starch may be dusted in

the armpits, folds of the neck, about the groins and buttocks. After the infant has been dressed, the ears are dried and the nostrils cleansed with cotton applicators (cotton wrapped about the end of a tooth pick). The scalp is then thoroughly dried, and the hair brushed or combed.

**Genital
Organs**

The sex organs in girls as well as boys should be well lathered, at least once each day. In the latter the foreskin should, if possible, be drawn back at least once a week and the white particles (smegma) removed with an applicator. Circumcision is sometimes necessary when the foreskin is too long or very adherent.

"Hardening"

As the child grows older the time spent in the tub may be prolonged to five or ten minutes. During hot weather this is advisable. When he can stand, one should begin to increase his resistance by sprinkling a cupful of cold water down the spine, just before he is taken from the tub. After a few weeks a cupful of cold water may also be sprinkled over the chest, and as he gets older, the temperature of the room and the bath may be gradually lowered. Immediately after the cold douche, he should be wrapped in towels and dried, a little friction being used to stimulate the circulation.

Early autumn is the best time to begin "hardening."

Air

Sun baths on warm days are very beneficial. The coat of tan should be acquired very gradually, as the skin is very sensitive.

Sun Baths

The head and eyes should be protected, all clothing should be removed for the ten to twenty minutes that the infant is exposed to the direct rays of the sun. This is considered one of the best methods of preventing rickets.

The hardening process advocated by some, whereby the infant sleeps all night in a very cold room or on an open porch, has lost many adherents. If ice forms (32° F.) on the top of a glass of water near the crib the air is too cold for the baby. "Fresh" air does not necessarily imply very cold air. Enclosed sleeping porches may be used at night if drafts can be avoided.

Cold Rooms

Breathing bad air even for a few hours is harmful. The condition of the air in the nursery in the morning indicates the amount of ventilation that has taken place during the night. The air of the nursery should never be offensive.

Bad Air

Opportune times to give the nursery thorough airings are in the morning before the

Ventilation

child gets his bath and in the afternoon while he is out of doors. During the winter the windows should be opened a little from above and below. Night air is as wholesome as day air. Ventilators are very practical. The crib should be in a corner of the room where there is no draft; a screen placed in front of a window or around the crib will keep the draft off.

Moisture

The air of heated rooms is usually very dry, and provision should be made to increase the amount of water vapor. The use of humidifiers for steam or hot water heat is advisable. A pan of water on the radiator does not produce sufficient moisture.

Sleep

The young infant should sleep quite soundly the greater part of the day and night. If he is not awake at the feeding hour, he should be wakened, for regularity in this respect is of paramount importance. He should be held over the arm or shoulder after each meal to allow air in the stomach to escape, and then he should be put to bed. Rocking or singing him to sleep must be avoided. If he is fretful before, during, or after feeding, the cause should be determined. The fretfulness is often due to over-

feeding, overclothing, soiled diaper, or cold hands or feet. Soothing syrups, paregorie, etc., are harmful and must never be used to induce sleep.

From the second to the sixth month he should sleep at least sixteen hours of the twenty-four, this number decreasing as he gets older. The morning nap may be shortened after the first year, but the afternoon nap should be continued until after the fourth year. An infant should not be allowed to fall asleep while taking food. If he dozes off after nursing ten minutes, he should be placed in the crib and not be given food until the next feeding time.

Out of Doors

The baby carriage should be substantial, convenient, well-sprunged, rubber-tired, and have an adjustable top with storm and summer hoods. The hair mattress should be covered with a down pillow, rubber sheet, plain sheet, and blanket. An extra pillow may be used for the head. On cool days the baby, dressed in cap and coat, is placed in the carriage and covered with several woolen blankets, the amount of cover used depending upon the severity of the weather. Infants should not be fed while out of doors.

**Baby's
Carriage**

**Out of
Doors**

Thriving infants may be out of doors for a few hours on non-windy, sunny days after the third week, providing the weather is not very cold. Babies born in late autumn, winter, or early spring, should be gradually accustomed to cold air before being taken out of doors. This is done by dressing them in out-of-door clothes, and opening the windows of the nursery, but drafts must be avoided. Such an airing should gradually be increased to an hour. If a veil is used, it should be washed daily. When the child is dressed for out-of-doors, the windows must be open or he must be taken outdoors immediately, in order to avoid catching cold.

Cart

When the child walks fairly well, a cart may be used in place of the carriage. It should be well constructed, and have a back rest. Restraining straps may be necessary to keep the child from falling out.

Physical Development of the Infant

The body of the infant is not that of an adult in miniature. While the head is larger in proportion, the face is smaller. The fontanelle (soft spot), usually rather large at birth, grows smaller toward the end of the first year, and should be closed by the eight-

eenth month. The hair present at birth is replaced during the first few weeks by a lighter crop, which usually grows somewhat darker. Tears and perspiration are seldom noticed during the first few months. The healthy infant usually holds his head up at three to four months, sits alone at six to seven, creeps at eight to ten, stands at twelve, and walks at fourteen months. The height of newly born boys averages about twenty inches, that of girls about nineteen inches. The rate of growth decreases with age. During the first year it is about six inches, during the second about three inches. (See table, page 168.) The pulse of the young infant beats about a hundred and twenty times a minute; after the first year it is appreciably slower. The respirations of the newly born are also more rapid (forty to thirty per minute).

Height

The initial loss in weight (normally about eight to ten ounces) which takes place during the first few days after birth should be regained by the tenth day. The average infant doubles his weight during the fifth month and trebles it at the end of the first year. During the second year the infant usually gains about six pounds. (See table, page 169.)

Weight

Teething

Customs are handed down from generation to generation, dating back hundreds of years. So deeply rooted are some false notions that they are overthrown with great difficulty. This applies especially to some of the ideas about teething. Teething is a normal process, and, as such, should not cause more pain or trouble than the growing of hair and nails. The development of the teeth begins months before the baby is born and their appearance is merely an incident in their development. Nevertheless, teething is, at times, still blamed for many ills. It has thus in times past been blamed for cough, diarrhea, nasal discharge, earache, swollen glands, fever, rashes, and convulsions. The result of this parental ignorance is that the infant must, under such circumstances, endure pain until Nature corrects the underlying condition or until the child gets so much worse that a physician is called. By such delay, an infection in the ear, bladder, or glands may become severe. The infants of today are fortunate that the lancing of teeth has become obsolete.

**Teething
Pains**

It is true that pain and fretfulness frequently manifested during the teething period are more pronounced in bottle-fed babies, but these symptoms are usually due

to nutritional disturbances. When so-called "teething pains" are present, the quantity and quality of the food deserve investigation. If there is fever, a careful physical examination of the infant, including throat, chest, and ears, or an examination of the urine may reveal the cause of the trouble. Relief is usually rapid when a diagnosis is made and the proper treatment instituted. Swollen gums may possibly be somewhat tender; rubbing with a cold, wet spoon will then bring relief. Lancing of gums seldom aids an advancing tooth, and may become the source of an infection. "Pacifiers" of all kinds are harmful and dangerous. Ivory teething-rings and the ordinary spoon are very satisfactory for teething infants to bite on.

Pacifiers

The deciduous ("milk" or "baby") teeth should appear in pairs. Three to ten weeks is the usual interval between pairs. The first pair usually appear before the eighth month, at twelve months there should be three to four pairs, at eighteen months six to eight pairs, at two years eight pairs, and at two and a half years ten pairs. A delay or marked irregularity may be due to previous illness, improper feeding, rickets, or other nutritional disturbance. Artifi-

cially fed infants are often given phosphorized cod liver oil for weeks or months to aid tooth and bone development. The diagram illustrates the sequence in which the teeth usually appear:

h	f	g	c	b	:	b	c	g	f	h
h	e	g	d	a	:	a	d	g	e	h

Explanation of the diagram:

aa—lower central incisors (first to appear)
 bb—upper central incisors
 cc—upper lateral incisors
 dd—lower lateral incisors
 ee—first lower molars
 ff—first upper molars
 gg—upper canines (“eye” teeth)
 gg—lower canines (“stomach” teeth)
 hh—second molars

When the infant has about twelve teeth, one should begin to care for them. An applicator dipped into a solution of baking soda (1 teaspoonful of soda to eight ounces of water) should be brushed over and between the teeth twice a day. After the second year a child's tooth brush should be used. The bacteria of the mouth act on food particles that are not dislodged. Acids are thus formed which attack defective teeth and cause tooth decay and bad breath. The quality of the teeth is influenced by hered-

ity, by acute and chronic diseases, and by diet. Proper care of the "baby" teeth has a beneficial effect on the permanent ones.

During the first few months the daily shampoo is part of the bath, but later, one shampoo a week is usually sufficient. If the hair is dry and brittle, it should be washed only once in two weeks, after which a little castor oil or vaseline may be rubbed into the scalp. When the child gets older the hair should be thoroughly brushed several times a day.

Hair

The toe and finger nails should be cleansed with a flat tooth pick shortly after the bath. They may be shortened once a week with paper file or scissors.

Nails

The bath, crying, and kicking of the feet are the first means of exercise. Changing the child's position in the crib after each meal aids the head and body to develop symmetrically. It is a good plan to place him on the back in the morning, on one side after the bath, on the other in the afternoon, and on the abdomen at night. Kicking with the feet should be encouraged by uncovering the legs for an hour or more each day. When he begins to creep he should be placed in a "pen" or baby-yard for an hour each day. Standing and walking are thus mastered

Exercise

Baby-yard

Drafts

more quickly. As the coldest air of a room is nearest the floor, it is wise to place the "pen" in that part of the room where there is the least draft.

Creeping

Infants need not learn to creep. In fact, those who creep very well often walk rather late. Creeping has two other disadvantages—the child is more exposed to drafts and is likely to pick up things from the floor.

Walking

Bowlegs, knock-knees, deformed pelvis, or curvature of the spine are not likely to occur if the child has been properly fed during infancy. Walking will be attempted as soon as the bones and muscles are strong enough. Heavy babies, infants who have been ill, and those who have had feeding disturbances or rickets are usually late in walking. They should not be urged; if the diet is correct, walking will be attempted as soon as the infant has developed sufficient strength. The baby tender or "walker" should be used only when the physician orders it.

Outline of the Daily Routine

(For infants under six months)

6 to 7	A. M.	First nursing or feeding.
9	A. M.	Bath.
10	A. M.	Second nursing or feeding.
11 to 1		Out of doors when the weather permits.

- 2 P. M. Third nursing or feeding.
- 3 to 5 P. M. Out of doors when the weather permits.
- 5 to 6 P. M. Recreation or exercise hour.
- 6 P. M. Fourth nursing or feeding.
- 10 P. M. Fifth nursing or feeding.

Infants under ten pounds may have a feeding during the night.

By following a daily routine the baby soon awakens at meal times, has a bowel movement before his bath, awakens in the late afternoon for his recreation hour, and sleeps peacefully at night. As the child grows older the recreation hour may be utilized to teach him to sit, stand, walk, and talk.

Training

Behavior

Fretfulness, disturbed sleep, sleeplessness, and crying are frequently due to errors in nursing or feeding. The interval between feedings may be too short, the food of improper strength or amount. Underfed infants usually behave better than those who get too much food. The feeding interval recommended by the physician must be observed; the food must never be strengthened or increased without his knowledge. Fretfulness when the bottle is taken away does not always imply hunger.

Crying and whining—expressions of dis-

content or pain—are significant to the trained ear.

**The Fretful
Cry**

The fretful cry signifies discomfort. One may find the napkin soiled, the hands or feet cold, the covers too plentiful, the garments wrinkled, the room too light or noisy, the air impure or too warm and dry, or that the child desires a change in posture. When the cause is removed the cry ceases.

**The Colic
Cry**

If the abdomen is distended or the bowel movements frequent, the cry is probably due to colic. It is often accompanied by drawing up of the legs. It may be temporarily relieved by the expulsion of gas or stool. On being offered food or water the child may quiet down temporarily. It is important that this cry be recognized early; it is a safety-note which Nature has instituted. If this cry is not heeded and the feeding rectified, dyspepsia may soon develop; or, if the weather is hot and the food is strengthened instead of weakened, one of the more severe types of nutritional disturbance may develop. The dangers for the bottle-fed infant are naturally much greater than for the breast-fed.

The Pain Cry

The cry of pain due to earache, etc., is different; in older infants it may be more like a whine. It is not quieted by attention,

food, or water. There is often a rise in temperature. The underlying cause can usually be diagnosed by the physician and proper treatment may bring early relief.

The hunger cry may occur before or after nursing or feeding. It merely signifies that the digestion and appetite are normal. If the amount of food is insufficient, the weight does not increase as it should. The stools may be infrequent or constipated. The child may act famished until he gets his food. He may begin to cry when he has finished eating. Infants very much underfed may be exceptionally good.

**The Hunger
Cry**

The cry of thirst is frequently overlooked. When the weather is hot, the room warm, or if the little one has a fever, the cry may be due to thirst. Giving a few ounces of warm, boiled water then quiets him. It should not be given within an hour before or after a meal, nor should sugar be added.

**The Cry of
Thirst**

The earlier that the cry of temper, the outburst of disappointment, is mastered, the better. Giving the child his way may quiet him, but this yielding makes control more difficult. Most irate tempers are not inherited, but developed. This cry is strong, the face becomes flushed, the arms and legs are held stiff or are moved freely.

**The Cry of
Temper or
Anger**

As the child gets older he may hold his breath. This cry is soon recognized; in fact, one usually knows what the child wants. The most effective remedy is to let him "cry it out." A few futile attempts will teach him who is master. The more he has been humored, the more difficult will be the task; and the earlier one begins to teach him control of temper, the better.

Spoiling the Child

Spoiling the child often begins during the first months of infancy. Many children, especially the first born or the only child, get what they want every time they want it. Such an infant, much to his detriment, soon masters all he surveys. Fond grandparents are not infrequent offenders. Fondling, caressing, and rocking should be reduced to a minimum. This caution does not mean that the infant should never be taken up or held; in fact, a certain amount of maternal devotion is necessary, and the recreation hour is intended for this. Infants soon become nervous, however, through incessant caressing and rocking. When the child is fed, he should receive only the necessary attention (changing of napkin, etc.), then be placed to bed, tucked in, the light turned out, and the door closed. Rocking soon spoils an infant. A few hours of crying each

day is healthful exercise, and is indulged in more or less by all normal infants. There may be something wrong with the infant who never cries.

Teasing has a bad effect on conduct and disposition. Older children must play gently with the baby, and playmates who tease must be avoided. Playmates of the proper age and temperament usually have a strong influence on the mental development of the child.

Teasing

The child should learn to respect not only his parents, but also his nurse and other people. This result must be achieved by more or less discipline. It must be remembered, too, that anger or rage on the part of his elders has a bad effect on the plastic mind of the young. A child should be taught to do as he is told, and his faults must be corrected early. Though sternness may be necessary, threats seldom accomplish much. A mother who threatens her child soon loses his confidence, and naturally her control over him begins to wane. If a child does not mind, the fault usually rests with his early training.

Punishing

Threats

The privilege of kissing the baby must be limited to the healthy adult members of the family. The person who picks up or fon-

Kissing

dles the infant should first wash her hands and face. The feet and forehead are the safest places to kiss an infant. As soon as the child is old enough, he should be taught to turn his head or run away when visitors attempt to kiss him. The mother and nurse should protect him from such affliction. A nurse should never kiss her charge. Anybody with even the slightest cold must be excluded from the nursery where hats and coats should never be worn.

Toys

As infants are in the habit of putting everything in their mouths, toys must be large, smooth, and washable, as well as indestructible.

The infant needs quietude and rest during the first two years, for his brain is developing very rapidly. At birth he can scarcely see a bright light nor does he focus on objects until months later. He discovers his hands when he is about three months old, and smiles, chuckles, and "coos" shortly after that. At six months he recognizes mother and nurse, and then learns to grasp objects and hold them. Sitting, standing, and walking require mental development as well as muscular activity. The first words that all understand are often uttered before the first birthday, although his

Talking

mother understands his language long before that time. Many normal children do not enunciate distinctly under the second year. Time should be spent daily in teaching a few simple words.

If a child does not talk at two years, the physician should be consulted. Some infants carry on conversations long before that age.

Correction of lisping, stammering, and indistinct enunciation should be attempted as soon as detected. The child should be taught to watch the lips of the mother or nurse as she slowly says the word in question, and be encouraged to repeat it. This must be done again and again each day until the words are properly spoken. Patience in this respect is usually rewarded. Stammering usually develops after infancy and may need special training.

**Retarded
Speech**

**Lisping
Stammering**

CHAPTER II

THE NURSING INFANT

Prenatal Care of Breasts

Physicians usually recommend routine care of the nipples before, as well as after, delivery in the hope that trouble during nursing will be minimized. Substances like diluted alcohol, glycerin, and tannic acid harden the nipple, while others like cocoa butter, lanolin, borated and benzoinated vaseline keep the nipples soft.

Care of Nipples

Before and after each nursing, a saturated solution of boric acid should be applied to the nipples with a large sterile applicator. After nursings, sterile cocoa butter, borated or benzoinated vaseline, lanolin or alboline may be applied. A piece of sterile gauze is then placed over the area before the binder is pinned.

Breast Troubles

Hard "lumps" in the breast are usually due to insufficient emptying. If the infant does not empty the breasts, manual expression or the breast pump must be resorted to. Lack of attention to this warning is often followed by an early decrease in the milk supply.

Soreness of the nipple is often due to too frequent nursing or to maceration of the nipple as a result of leaving the baby at the breast too long. Twenty minutes is the maximum nursing period; at times, six to ten minutes may be long enough. Through an early discontinuance of the night nursing (when the baby weighs ten pounds), the nipples are less likely to become sore. Sterile benzoinated vaseline (5 per cent), or compound tincture of benzoin may be applied to sore nipples after each nursing. Lead nipple shields worn between nursings are considered useful.

The "fissured" or "cracked" nipple is most common during the first few months of nursing. Fissured nipples are very painful to the mother while the child nurses. Further, the infant may swallow escaping blood with the milk, and when this is vomited, it causes much alarm. Pus-producing bacteria of the skin may enter the breast through a fissure and cause a deep-seated infection, producing inflammation or abscess of the breast (mastitis). Weighing the infant before and after nursings when a nipple shield is used usually shows that very little milk is obtained this way. By its continued use a milk-supply is endangered, as

the breasts receive insufficient stimulation. Pain may be relieved by emptying the breast several times a day. If the flow is started with difficulty, a breast-pump may be of aid. If the breast becomes inflamed and the mother has fever, she should remain in bed and use warm borie acid solution dressings frequently changed. When an abscess needs opening, the physician should decide whether nursing from that breast should be discontinued. The infant should nurse from the other breast at regular intervals. Milk expressed from an infected breast may be pasteurized and fed. Temporary complementary feedings may be necessary. Hands must always be washed before touching the breasts, and the breast-pump, shield, etc., should be sterilized by boiling before each use.

**Maintaining
the Supply**

If a breast is not emptied three or more times each day (by the infant, manual expression, or pump), the production of milk soon decreases. This condition holds true with an overabundant supply as well as in cases of prematurity, weakness, or illness of the infant.

**An
Insufficient
Supply**

When the supply does not increase in spite of regularity in nursing and subsequent manual expression, and if the infant's

weight fails to increase, the supply is insufficient.

The old adage, "strong enough for the birth, is strong enough to nurse," has two exceptions—active tuberculosis of the mother, and intercurrent pregnancy. Inverted nipples, deformity, and acute diseases are usually accompanied by a rapid decrease in supply; one should, however, continue to use whatever milk is available. "Flat" nipples usually "come out" sufficiently if a pump is used each time before the child nurses.

**Contra-
Indications
to Nursing**

A nervous mother may have varying quantities of milk. This condition is probably dependent upon irregularities in diet, fluid intake, nursing period, and sleep. A lack of routine will endanger the best milk supply. A temporary reduction in the amount of milk, the result of anger, fright, distress, sorrow, worry and pain is due to a break in routine. Occasionally, though the breasts fill, the infant fails to get the milk, as the "purse-string" muscle about the exit of the nipple does not relax when the infant nurses. The application of warm, wet towels will probably aid in overcoming the tension. The average child, however, easily overcomes the resistance encountered at the

**Conditions
Which
Influence the
Supply**

beginning of a nursing. Occasionally the muscle at the exit of the nipple is so relaxed that the milk drips continually. This dripping does not imply an overabundance. Thick absorbent pads should then be worn as otherwise the nipple may fissure or become sore.

Menstruation and Nursing

Menstruation may cause a temporary decrease in the milk supply, and the infant may manifest his dissatisfaction in various ways. The supply is usually back to normal, however, within a week.

By an analysis of the breast milk is usually meant a determination of the percentage of fat. Such an examination has, as a rule, very little value, and may be misleading.

Stimulation of Supply

The quality and quantity of milk are little influenced by diet or tonics; none of the advertised nostrums are more effective than warm milk, weak tea, or water. On the other hand, if the mother is weak or anemic, anything done to improve her general condition may be reflected in an increase in milk production. The sucking of the healthy infant is the best stimulus for the milk supply. Completely emptying each breast three times a day will usually maintain a supply.

Supply and Demand

Weeks may pass before the proper relation between supply and demand is estab-

lished. A supply that is at first insufficient may become too abundant, and if the proper measures under such conditions are not resorted to, this excessive supply may soon wane or entirely disappear. Discomfort due to overproduction must be relieved. If the breasts produce more than the child should have, the milk should be expressed daily and discarded. Failure to empty an overfilled breast greatly endangers the supply.

Nursing Technic

The mother should lie on the side to be nursed with the infant facing her. The one arm holds the child close to the breast, the other keeps the breast away from the infant's nose. (See Fig. 1.)

**Nursing
While
Lying Down**

With the mother's legs crossed or her foot supported on a stool, the nursling's head rests on her elevated knee. The one arm presses the babe to the breast, the other keeps the breast from the nose. (See Fig. 2.)

**Nursing
While Seated**

Technic of Manual Expression

Completely emptying the breast regularly three times a day serves to augment or restore the supply. If the infant is too weak or too young to empty the breast, if the supply is too abundant, or if the milk is waning,

either manual expression or pumping must be resorted to. The increase in the milk supply of wet-nurses exemplifies what manual expression will do. Patience is a prerequisite. The technic is as follows:

1. After the ball of the thumb and index



Fig. 1.—Proper way of nursing while lying down.

finger of one hand have been placed on opposite sides of the nipple just outside of the pigmented area, they are pressed firmly against the breast.

2. Maintaining this pressure, the thumb and finger are brought toward each other back of the base of the nipple.

3. The thumb and finger are then pulled

forward slightly, whereby the milk is forced out.

A repetition of these three movements



Fig. 2.—Proper way of nursing while seated.

many times after each nursing frequently increases the production of breast milk gradually and continuously.

Nursing Routine

At the time of nursing, the napkin is changed, the nipple is cleansed with borie acid solution, and the child is nursed the required length of time. He is then held over the arm or shoulder until the air in the stomach is belched. The napkin may again need changing, after which the infant is put to bed, and should not be picked up for several hours. The breasts then receive the necessary care. Weak and newly born babies may need constant coaxing while at the breast. As already pointed out, the thorough emptying of each breast is most essential in maintaining and increasing the supply of milk.

Frequency

No rule applies to the frequency of infant feedings, for we are dealing with individuals, no two of whom are alike. The argument for a long interval between the feedings is that it gives the digestive organs a rest. Although the frequency of nursings is still a topic of discussion, some advocating the short interval, others the long, the following plan has approved itself generally:

- 5 to 6 nursings in 24 hours if above 8 lbs.
- 6 nursings in 24 hours if between 7 and 8 lbs.
- 7 nursings in 24 hours if between 5 and 7 lbs.
- 7 or 8 nursings in 24 hours if below 5 lbs.

A thriving nursling over eight pounds in weight will usually go through the night unfed (from ten P.M. to six A.M.) without much resentment. The longer one puts off going through the night without a nursing, the more difficult it becomes.

Premature, delicate, and vomiting infants must be nursed according to the physician's order.

Infants of the average weight thrive best on the four hour interval. This is usually most convenient at six A.M., ten A.M., two P.M., six P.M., and ten P.M., (two A.M.) Nursings according to the three hour interval may come at six A.M., nine A.M., noon, three P.M., six P.M., etc.

**Nursing
Hours**

An infant should nurse until he gets the proper amount for his age and weight. Some must stay at the breast twenty minutes; others get all they need in one-half or one-third that time. An infant nurses by instinct. He usually nurses rapidly at first, swallowing with each sucking movement; in fact, when the milk comes very freely he often swallows in rapid succession for some minutes without sucking.

Duration

The only way to determine how much an infant gets is to weigh him on accurate scales before and after each nursing. The

Quantity

increase in weight is the amount of milk in ounces that has been consumed. The clothes need not be removed for this simple and accurate test. The well-being of an infant is dependent upon the quantity of food digested and assimilated, not upon the amount fed. The quantity consumed increases slowly during the first ten to twelve weeks, and then continues fairly constant at between twenty-six and thirty ounces a day until the infant is weaned at nine months. The average infant usually takes six to ten ounces a day during the first two weeks; thereafter the quantity gradually increases. The well infant should get in twenty-four hours about two times as many ounces of breast milk as his weight in pounds; for example, an infant weighing eight pounds needs about sixteen ounces of breast milk in twenty-four hours (about three ounces five times a day). As the amount of milk may vary during the day, a twenty-four hour record must sometimes be kept. (See Chart, page 166.)

Rotation

The quantity of milk in one breast is usually sufficient for a nursing. If the infant is nursed from one breast at one feeding and from the other breast at the next feeding, the nipples are less likely to cause trouble.

Nursing at both breasts each time also endangers the supply, as the partly emptied breasts fail to get sufficient stimulation. If an infant prefers one breast, he should be put to the other just as frequently.

Both breasts, however, may be given at a nursing under the following conditions:

**Both
Breasts**

1. To temporarily relieve congestion or overproduction.
2. To stimulate a very scant supply.
3. To decrease the supply during weaning.
4. To avoid the richest milk in case of eczema.

Two infants of the same age and weight may have stomachs of varying capacity; accordingly some infants can take twice as much as others without regurgitating. This greater capacity may be due to the fact that the "valve" between stomach and intestine in the former relaxes much more easily than in the latter, and thus allows fluids to pass into the intestine. An infant who regurgitates (spits up) after nursing probably gets more than his stomach can hold. The average newly born should be able to take one to two ounces at a nursing, three ounces at one month, six to seven

**Stomach
Capacity**

ounces at six months, eight ounces at a year, and twelve ounces at two years.

The newly born should be given water frequently each day until the milk supply is well established. After this, water must be

Water



Fig. 3.—Year-old infant.

given only a few times a day, as quenching his thirst might interfere with breast stimulation. After the third month, especially during warm weather, it is advisable to give an ounce or more of boiled water (unsweetened) several times a day, about an hour

before nursing. Giving water from the bottle facilitates bottle feeding and weaning.

**Signs of
Successful
Nursing**

The birth weight should be regained



Fig. 4.—Overweight nine months old infant.

by the end of the second week. The weight should increase about five to eight ounces a week during the first few months, and thereafter about a pound a month. (See

Appendix, page 168.) An infant weighing seven pounds at birth usually doubles his weight during the fifth month, and trebles it by the end of the first year. (Fig. 3.)

Routine Life of the Nursing Mother

The nursing mother should live, as far as possible, as she has been accustomed to. Her clothing must be comfortable; corsets that hamper the breast should not be worn, though the breasts may be supported by a well-fitting binder. Fatigue, worry, sudden joy, fright, must be avoided. Skating, tennis, swimming, and horseback-riding should not be indulged in.

The main dietary restriction is to avoid overeating. If certain foods cause digestive disturbance, loss of appetite, or constipation, they should be avoided. Salads, spices, etc., are not necessarily harmful. Constipation may be aggravated by cocoa or chocolate. If an increase in weight is desired, gruels (cooked in milk), egg-nogs, warm milk, etc., may be served with each meal, and a glass of milk may be taken during the morning, afternoon, and evening. If milk is unpalatable, it can be disguised by the addition of a little coffee, postum or malted milk.

The nursing mother should sleep at least eight hours at night and take a nap during the day. She should be out of doors at least a few hours daily.

**Anti-
Constipation
Treatment**

If the bowels fail to move each day, measures must be instituted at once to assist in establishing regularity. Coarse cereals, bran bread, fruit, and vegetables should be eaten at least twice a day. Drinking two glasses of cold water half an hour before breakfast is sometimes very effective.

If constipation persists, in spite of dietary measures, then the so-called "fruit laxative" may be used. Half a pound of washed prunes with the stones removed, and half a pound each of figs and seeded dates are mixed and put through a meat grinder; to the mixture an ounce or two of powdered senna leaves are added, and the whole is then kneaded. A tablespoonful or less is eaten at night. When the proper dose is established, squares or balls of it may be rolled in sugar, and thus made more palatable.

If these measures are without avail, the physician should be consulted before resorting to purgative medicines. Enemas, used regularly, may prove harmful, as the natural muscular activity of the intestinal wall is thus decreased.

**Stopping
Breast
Secretion**

For various reasons it may become necessary to suddenly stop the secretion of breast milk. This is best accomplished as follows:

1. Do not empty the breasts—no matter how full and tense they become.

2. Reduce the intake of fluids for at least a week.

3. Adjust a tightly fitting binder from day to day.

4. If necessary, take a saline laxative (sodium phosphate) once or twice a day.

In this way, the breasts increase very much in size for thirty-six to forty-eight hours, becoming more or less tense and painful. After a few days the pain decreases, and the breasts slowly decrease in size with a disappearance of the milk.

Weaning

If an infant is kept on the breast more than nine months, he usually grows pale, his muscles become soft, and he fails to increase in weight. It is therefore advisable to wean infants about the ninth month. In spite of an abundance of milk at this time, it is better for the child to begin to get other food, preferably cereals (cooked in milk and water), vegetable purée, and fruit juices.

One must proceed gradually, however, to wean the child, and never attempt this hazardous step in nutrition without conferring with the physician. The season of the year or other circumstances may sometimes make its postponement advisable. It is safer, for instance, to nurse until autumn than to wean during the summer. If the little one has been getting a little water in the bottle daily, or has been given one artificial feeding since the fifth month, difficulty is seldom experienced.

Infants exclusively breast-fed for nine months or longer are usually weaned from the breast with more or less difficulty. For such children, it may become necessary to discontinue the breasts rather abruptly. When this is done, some refuse to take any food or water from the bottle, cup, or spoon for days. Such a child should neither see nor hear the mother while weaning is being attempted. Gavage feedings may become necessary in obstinate cases. Water, sweetened with a little sugar and given by spoon, is usually the first thing taken voluntarily. Weak milk mixtures or expressed breast milk may be offered from spoon or cup until there is no more opposition.

When a mother becomes ill, it may be

necessary to substitute the bottle for the breast without delay. If the infant weighs less than ten pounds, properly prepared protein milk is undoubtedly the best substitute, whereas larger infants usually do well on weak milk mixtures which may be gradually strengthened and increased. A slight loss in weight for the first few weeks is without significance, provided the food agrees with the child.

Nutritional Disturbances of the Breast-Fed Infant

Everyone realizes that breast milk is the ideal food, and that it is more prudent to keep a well baby well than it is to try to cure a sick one. The most frequent nutritional disturbances of breast-fed infants are the result of:

1. Overfeeding.
2. Underfeeding.
3. Intercurrent disease, causing a lowered tolerance for food.

The earliest and most frequent complaint is colic. This is usually due to overfeeding, irregular nursing hours, nursing too frequently or too long. Some mothers and nurses still favor "twenty minute nursings" instead of weighing the child before and

**Overfeeding
and Colic**

after and determining how much he gets. One child may get an ounce in twenty minutes, another may get six or more ounces. The scales should determine whether one is dealing with over- or under-feeding. In the consumption of more food than can be taken care of, fermentation with gas production takes place. This causes more or less distention and abdominal pain, commonly called "colic." Regurgitation, vomiting, passing an excess of gas, and the colic cry are Nature's way of calling our attention to overfeeding. Possibly five instead of six or more nursings, or shortening the time to five or ten minutes will relieve the trouble. This condition is most common during the first three months.

**Dyspepsia or
Indigestion**

If the mother or nurse fails to heed the above warnings, the condition may slowly improve as the child grows older and stronger, or it may get distinctly worse. Sometimes, the person in charge feels certain that the child is "suffering from hunger," or that "the mother's milk disagrees," and a bottle of artificial food (often improperly prepared) is given. In other cases the crying babe is given sugar water, is allowed to nurse longer or more frequently, or a hot water bottle and more covers are

added. Any of these measures and many more (laxatives, soothing syrups, paregoric, rocking, enemas) usually make matters worse, and in a few days the little one may have dyspepsia or indigestion. This is characterized by diarrhea (four to eight green stools with mucus and curds), gas which is frequently expelled, and vomiting. Infants who exhibit these symptoms usually do better by being given only barley water (without sugar) for twelve hours. After this, the breast may be given every four hours, preferably only five nursings in twenty-four hours. The duration of a nursing must be very closely watched—the child should be weighed before and after each nursing. A colonic flushing may temporarily relieve abdominal pain and distention and must occasionally be resorted to. As many infants who have suffered from indigestion have been spoiled by being humored, crying is usually the last symptom to disappear.

The first indication of underfeeding is a failure to gain sufficiently. The infant is usually good, often sleeping very well at night. When nursing, the child either works more or less greedily for twenty minutes or longer or, if somewhat older, he will nurse rather greedily for a few minutes,

**Under-
feeding**

then stop and cry, and possibly repeat this procedure, and finally refuse to nurse. If a stream of milk cannot be produced by manual expression and the breast is soft, the little one is probably underfed. There is no vomiting, the temperature may be subnormal, and the fontanelle depressed. The bowels move infrequently, the stool sometimes being green with very little substance (hunger stool). By weighing before and after a twenty minute nursing, the actual amount taken can be determined. When artificial food is prescribed for such an infant, the age, weight, and time of year are factors that must receive attention.

**Intercurrent
Diseases**

Infants with fever should be given less food. When the temperature is above 102° F. the duration of nursing should be shortened and water should be given more frequently. The breasts should be emptied several times a day until the fever subsides.

CHAPTER III

THE PREMATURE INFANT

Statistics show that of one hundred births, three infants die before the end of the second week, and that premature birth is responsible for over half of these deaths. Still-births (not counted as deaths) are one and a half times as frequent as deaths from all causes during the first two weeks. Measures such as those outlined under *Prenatal Care* serve to prevent prematurity and still-births.

A premature infant is one born before the allotted time (i.e., before two hundred and eight days after conception). An infant with a birth-weight less than two and a half pounds seldom does well; one from two and a half to four pounds may live and grow normally if proper measures are instituted early, and one above four pounds usually thrives if the child receives proper care and breast milk. Nothing should be left undone to make a premature infant thrive. The three essentials in the case of the premature infant are: maintenance of uniform warmth, proper food, and avoiding infections.

Maintaining Uniform Warmth

The room in which a premature child is born should have a temperature of 75° to 80° F. The infant should be covered with a warmed blanket and placed into a blanket-lined basket containing hot water bottles as soon as possible after birth. An initial chilling of the body must be avoided. Skilled nursing care is essential and, not infrequently, hospital care is necessary during the first few weeks or months.

Clothing

The most satisfactory garment for premature and delicate infants is the "premature jacket." This consists of two twenty-inch squares of cotton or wool covered with cheesecloth. One or more layers of cotton may be basted to the cloth. The infant is placed between the cotton squares and the latter are pinned so that only the head is exposed. As the child gains strength the thickness of the cotton is gradually reduced and when the weight reaches five pounds ordinary clothing is usually sufficient protection to maintain a normal body temperature. The "premature jacket" should be changed only three times a week. A small piece of cotton or cheesecloth takes the place of a napkin. A satisfactory crib can be made of a large

basket. A large, soft pillow is better than a mattress and three hot-water bottles maintain a more constant temperature than do electric heating pads or incubators. After the child is placed in the crib a light wool



Fig. 5.—Crib for premature infant.

blanket thrown over the basket should leave sufficient space for ventilation. A thermometer under the cover gives a fair estimate of the crib temperature. Room-, crib- and body-temperature readings should be charted two to four times in twenty-four

hours. The room-temperature should be about 75° F., the crib-temperature about 85° F. and the body-temperature between 97° and 100° F. The temperature of the water in the hot-water bottles should not be above 110° F. and one bag should be changed at a time as often as necessary. The room should not be large and the air should be kept moist by means of a humidifier or a pan of boiling water.

Handling

Premature infants should be handled very little and as carefully as possible. The child should be slowly turned from side to side many times during the day, but the posture should always be such that the respirations are not embarrassed. Heavy covers should never handicap respirations. Constant watch during the first few days is necessary so that oxygen can be administered if the lips or finger tips turn blue. An oil bath every two or three days and weighing once or twice a week are sufficient during the first few weeks. Changing the soiled cotton should not require handling of the delicate infant.

Proper Food

Breast milk should be given early as the weight loss is otherwise appreciable and

very slowly regained. Infants under four pounds should be given diluted breast milk the first few days. As the mothers of premature infants seldom have breast milk before the end of the first week, it should be gotten from another source (maternity hospital, infant welfare station, friend or wet-nurse). Such milk should be pasteurized or boiled. Infants weighing more than four pounds usually nurse well and may usually be put to the breasts after the first few days.

The smaller the infant the more difficult the feeding technic. Infants under four pounds seldom nurse well and very few are strong enough to take the bottle. Such infants usually do well on tube feeding (see Gavage, page 153) until they gain sufficient strength to take the breast or bottle. The Breck feeder is a novel device which relieves the infant of much work. It is a graduated glass tube like a large medicine dropper with a rubber bulb at one end and a small nipple at the other. Pressing on the bulb forces the milk out of the nipple, whereby the infant is relieved of much effort. Feeding by dropper or spoon is seldom satisfactory, as the child is likely to vomit the food. If the infant does not empty the breasts they should be drained

**Feeding
Technic**

regularly several times a day by manual expression or a breast pump. A supply may in this way be increased or maintained for weeks or months—until the child is strong enough to empty the breasts.

The amount and strength of the food is determined by the size of the infant. By the end of the first week a feeding usually consists of an ounce of undiluted breast milk. The smaller the child, the shorter the feeding interval, but more than seven or eight feedings in twenty-four hours are seldom necessary. The physician should be informed if food is refused or regurgitated. Vomiting, gas, diarrhea and colic are usually signs of overfeeding, overheating or improper technic.

If the mother's milk supply is insufficient and if breast milk from another source is not constantly available, a wet-nurse may be indispensable. The "want ad" column of the daily paper usually brings a number of applicants. The physician examines the candidates and their infants. Breast milk from a wet-nurse should be pasteurized at least until the result of the Wassermann blood-test is known. As it is essential that the supply be maintained, the wet-nurse's baby should empty each breast several times

Wet Nursing

a day. Her baby should sleep in the nursery and should be cared for by her. If he fails to thrive, complementary or supplemental food should be given. The wet-nurse should be kept occupied with light housework, sewing and mending, but she should have ample time for rest. Her food should be plain and substantial. She should drink sufficient water and two quarts of milk daily.

If a premature infant fails to gain or if the milk supply decreases, the cause should be determined early. Both babies should be weighed before and after nursings. A premature infant may have other congenital handicaps which often make progress tedious. When an infant attains a weight of eight pounds, breast milk is usually no longer necessary.

Artificial Food

Infants weighing less than four pounds seldom do well on artificial food. The best substitutes for breast milk are protein milk, powdered milk and condensed milk properly prepared and carefully fed.

Avoiding Infections

At no time is a cold more to be dreaded than in a premature infant. Any infection, but especially a cold, may seriously handicap the child's progress. Only the mother,

nurse, and physician should come in contact with the infant until the weight reaches eight pounds. Aseptic nursing technic must be observed until the infant is at least several months old. No one with a cold, or any other infection, should be allowed in the nursery. A nursing mother with a cold



Fig. 6.—Face mask.

should wear a face-mask, and should not cough, sneeze, or talk while near the baby. (See Fig. 6.) Children should never enter the nursery, nor should they ever come within a yard of a premature baby. As premature and delicate infants are very easily infected, prevention is of paramount importance.

Adopting an Infant

Before adopting an infant, one should find out as much as possible about the parentage. The Wassermann blood-test, tuberculin test, nasal culture, vaginal and eye smears should be negative. The feeding of an adopted infant should be under the physician's care. Underweight infants usually thrive if properly fed and cared for.

CHAPTER IV

ARTIFICIAL FEEDING

Cow's Milk

The best substitute for breast milk is pure, fresh cow's milk, modified to suit the requirements of the individual infant. The supply should preferably come from a mixed herd of healthy cows. Jersey and Guernsey milks are not very desirable for young infants on account of the high fat content. If the milk comes from one cow, it should preferably be from a Holstein.

Milk has been responsible for more disease and deaths than all other foods combined. In 1910 ten per cent of Chicago market milk and butter contained tubercle bacilli. The introduction of pasteurized and certified milk since that time has greatly improved matters.

Milk may be dangerous because:

1. Bacteria grow very rapidly in it.
2. It "spoils" when not kept cold.
3. The consumer cannot discriminate "good" from "bad" milk.
4. It is often used "raw."

These dangers can be avoided to a certain extent by:

1. Supervision of dairies and inspection of the milk supply by state and municipality.
2. Compelling dairies to pasteurize and refrigerate all milk entering cities.
3. Certifying milk which is obtained under exceptional dairy conditions.
4. Proper care of the milk as soon as it reaches the home.

Unpasteurized milk, used by residents of small towns, rural districts and summer resorts, should be strained, boiled for ten minutes and cooled rapidly (as soon as it is obtained). A visit to the dairy from which the infant's milk supply comes may not be amiss. The stables should have plenty of air and light, and must be well-floored. There should be no excess of dust, manure, or bad odor. The cows, especially their udders, should be clean, and the latter should be wiped with a clean, damp cloth before each milking. The milker should be healthy, his hands should be clean, and the pails and bottles should be sterilized before each milking. The more dirt and dust that enter the milk, the more bacteria will it contain; the warmer the weather, the more rapidly will

they multiply; and the longer the milk is kept before being pasteurized or boiled and cooled, the more likely will it be unwholesome.

Although the unsanitary dairy of a decade ago is rapidly disappearing, and most milk entering cities is either pasteurized or certified, great care must be exercised by the consumer to keep it from becoming unfit for use. Milk relatively pure when it leaves the dairy may, in the course of twenty-four hours, become swarming with bacteria. The bacterial count reflects the care which has been exercised in the milking and marketing. A count of 10,000 or less per c.c. (1 c.c. equals 15 drops) is ideal. Milk showing a count of 100,000 or more should not be used for infants. Bacteria belong to one of two classes: 1, the pathogenic (disease producing) such as streptococci, bacilli of typhoid fever, diphtheria, and tuberculosis; 2, non-pathogenic (more or less harmless), occurring in dust and on the udder. If the bacteria in the milk are not destroyed, either type of germ may menace health. The poisonous substances produced by the non-pathogenic bacteria can render milk unwholesome.

Infants are easily upset by "spoiled" Sour Milk

milk. Sour milk contains acid-producing bacilli which are not necessarily harmful.

Frozen Milk

While certain changes take place in frozen milk it may be used if quickly melted, boiled for ten minutes, and kept cold until used.

**Certified
Milk**

In the course of the last decade, many American municipalities have set up standards for a pure milk supply. Certified milk should have a very low bacterial count (10,000 or less per c.c.), must be free from preservatives, should not be over twenty-four hours old, and must come from cows that are free from tuberculosis (tuberculin tested). The stables, milking, and vending must withstand a rigid examination. The milk is placed in sterilized bottles and kept at a temperature below 50° F. until delivered. These precautions make certified milk high-priced. Certified Holstein milk is the ideal milk for young infants. The main objections to certified milk are that it often contains too much cream, and that there is no guarantee that the milker and cows are free from contagious disease. Apparently healthy cows may develop tuberculous udder disease during the interval between veterinary inspections. For these reasons there is a certain amount of risk even in raw certified milk. The numerous

outbreaks of scarlet fever and streptococcic sore throat among infants and children fed raw certified milk show that even certified milk should be boiled or pasteurized to be rendered safe for the infant.

A small group of physicians still recommend raw milk on account of the vitamins. These accessory food substances are as necessary for growth and life as are protein, fat, carbohydrate, water and salts. One vitamin present in milk is called "water soluble B," another, occurring in cream, butter, cod-liver oil and egg yolk, is known as "fat soluble A." We know that boiling fresh milk does not completely destroy these substances. If raw milk is prescribed, certified milk should be used.

Raw Milk

Heating milk to 150° to 160° F. and maintaining that temperature for thirty minutes destroys all germs except spores and renders the milk safe. It must be cooled quickly and kept cool until used. Most milk entering our cities is thus pasteurized. When the infant's food is prepared, the milk should be boiled or again pasteurized, cooled rapidly and kept on ice in sterilized feeding bottles.

**Pasteurized
Milk**

Boiling cow's milk in a single boiler for ten minutes not only destroys the germs,

Boiled Milk

but makes it more digestible and less laxative. Diarrhea, the bane of artificial feeding, occurs much less frequently with boiled than with raw milk. The constipating action, as well as the danger of scurvy, can be counteracted by the daily administration of a little diluted orange juice. This may be begun about the fourth month. By the use of a double boiler the boiling point is not quite reached, but maintaining this high temperature for ten to twenty minutes and then cooling rapidly destroys all harmful bacteria.

**Sterilized
Milk**

Boiling milk for fifteen to thirty minutes destroys all the germs (including spores). In this process, the flavor is markedly changed, the protein is rendered somewhat less digestible, and orange juice must be given daily to prevent scurvy, as much of the vitamin of the milk is thus destroyed.

**Skimmed
Milk**

Fat-free or skimmed milk is frequently used when an infant fails to digest whole milk. As commercial skimmed milk is a by-product of the modern butter industry, it is safer to let whole milk stand until the cream collects, and then pour or dip off all the cream.

Dry Milk

There are on the market several reliable brands of milk in powder form. The milk

used in their manufacture should be from healthy cows, obtained under sanitary conditions, and dried within twelve hours after milking. A quick drying process whereby the milk is not heated above the boiling point (212° F.) kills the germs while most of the vitamin content is preserved. Half or all of the cream is removed before drying to keep it from becoming rancid. Dry milk should be mixed with hot, boiled water, and strained. It must be freshly prepared once or twice each day. It is very useful in traveling or where pure, fresh milk cannot be obtained.

Most of the infants with severe nutritional disturbances coming to the attention of the specialist have had a proprietary "food" of one brand or another. Not infrequently a number of such "infant foods" have been tried in vain. The mother or nurse usually maintains that the directions on the package were followed. After the child's digestion has thus become very much impaired, careful supervision for weeks or months is often necessary to restore the child's health. Many of these infants get rickets. While most of the best known "infant foods" are not harmful, the ironclad formulæ, the short interval, and the use of unboiled milk make

**Proprietary
Infant
Foods**

this method of feeding extremely hazardous. The fact that vast sums of money are spent each year in advertising is ample proof that none of the patent "infant foods" is a panacea. The secret of successful infant feeding is to adapt the food to the individual infant, not to attempt to adapt the infant to ironclad feeding directions.

**Condensed
Milk**

Condensed milk has a very limited field of usefulness in infant feeding. If properly diluted it may be used for a short period when the infant needs a food very high in sugar and low in other constituents. Because of its extremely high sugar content (from 35 to 55 per cent), it is impossible to make a dilution approximate the proportions of fat, protein, and sugar as they exist in breast milk. On account of its cheapness, palatability, and ease of preparation, condensed milk still enjoys a certain degree of popularity which it does not deserve. The few children who apparently thrive on it would, most likely, do well on any food. An infant kept on it for months is usually greatly handicapped.

**Evaporated
Milk**

Unsweetened, evaporated milk is of value on long journeys, especially during warm weather, when fresh milk and milk powder cannot be procured. It is about twice as

strong as ordinary milk, and must be used within twenty-four hours after the can is opened. When it is given for a long time, starches and sugars should be added, and orange juice must be given daily.

To make buttermilk, boil a quart of skimmed milk five to ten minutes, allow to cool to 100° F., and add the buttermilk culture. This may be in the form of four ounces of "ripe" buttermilk or a solution of lactic acid bacilli (purchased from the drug store). "Buttermilk" tablets are seldom satisfactory. After mixing, it is allowed to stand in a warm place for six or more hours. It is then mixed with an egg-beater or small churn, passed through a fine sieve, and kept on ice. Four ounces of this will serve to inoculate another quart of milk, whereby one culture may serve for weeks. Buttermilk must be warmed very carefully to prevent curdling.

To prepare protein (casein-, albumin-, or Eiweiss-) milk, add one tablespoonful of essence of pepsin to a quart of raw whole milk. Allow to stand in a warm place (double boiler) for an hour, and then drain the curds in a sterile muslin or cheesecloth bag for an hour or longer (in the ice chest). Then rub through a fine colander or sieve

**Buttermilk or
Lactic Acid
Milk**

**Protein
Milk**

(36 wires to the inch) four or five times, using a pint of buttermilk in the process. After the addition of cooled, boiled water to bring the volume up to a quart, the whole is brought to a boil, during which time it must be vigorously stirred or beaten. The finished product should be kept in the ice chest. Dextri-maltose or another sugar should be added. When this milk is being warmed for a feeding, caution is necessary, as the milk curdles if heated above 100° F. The difficulties encountered in the preparation of this valuable food are manifold. Though it is invaluable for prematures and young infants deprived of breast milk, its main field of usefulness is in nutritional disturbances. Protein milk can now be had in powder form.* The powder as well as the mixture must be kept in a cool place.

Peptonized Milk

In the preparation of peptonized milk, unless otherwise specified, the milk is boiled for five minutes, and allowed to cool to 100° F. before the junket, pepsin, chymogen or peptogenic milk powder is added; it is then kept in a warm place (double

*Protein Milk—Merrell Soule Co., Syracuse, N. Y., and leading cities.

Albumin Milk—Louis Hoos, 5232 Kenmore Ave., Chicago.

Casein—Meade Johnson & Co., Evansville, Ind.

boiler) until it thickens. It is then mixed, passed through a sieve, and kept cold until used. It must be warmed carefully to avoid curdling.

To prepare malt soup, three ounces of malt soup extract are boiled in ten ounces of milk. In another saucepan two to four tablespoonfuls of wheat flour are thoroughly boiled in twenty ounces of water (with constant stirring) for ten to fifteen minutes. The two are then mixed, and after the whole has boiled about three minutes longer, it is diluted with water to total a quart. The proportions of milk, water, and flour vary according to the age and strength of the child. There are now on the market satisfactory malt soup "stock" powders. Malt soup is of value in feeding constipated infants with stationary weight.

Malt Soup

To prepare whey, boil a quart of milk for five minutes, allow to cool to 100° F., add two teaspoonfuls of essence of pepsin or a dissolved junket tablet, and allow to stand until firm. Cut the curd, but avoid stirring, warm gently for a few minutes, and then carefully strain through a boiled, double cheesecloth. The whey contains most of the sugar, salts, and water of the milk. If milk or cream is to be added, the whey should be

Whey

heated to 160° F. to inactivate the pepsin or rennet.

Eczema Soup

Add one and one-half teaspoonfuls of essence of pepsin to a quart of half-skimmed milk which has been boiled for five minutes and cooled to 100° F. A temperature of about 105° F. is maintained for half an hour. The thickened milk is then suspended in a sterile muslin bag until all the whey has drained off. The curds are passed through a fine sieve three or four times, then transferred to a sterile muslin bag and suspended in a large pan of water. The water is changed several times so that the curds are thoroughly washed, after which six and one-half ounces of the whey are added to the washed curds. To this mixture is added enough plain water or barley water to bring the volume up to a quart. After the required amount of dextri-maltose No. 2 has been added, the mixture is again rubbed through a fine sieve. As eczema soup curdles easily, it must be carefully warmed. It should be used only when ordered by the physician.

Preparation of the Infant's Food

Utensils

The utensils necessary for the preparation of the daily food supply should be used for this purpose only and should have a special

place in the kitchen. There are necessary: six or more nursing bottles (round, graduated, with wide mouth and short neck), an equal number of rubber stoppers and nipples (preferably the black, reversible kind), two wire baskets for the bottles (one for the ice chest, the other for the used



Fig. 7.—Utensils needed in milk modification.

bottles), a sixteen-ounce graduate, a funnel (to fit the bottles), a two-quart double boiler, a quart pitcher, a large, deep saucepan (for boiling the bottles, nipples, and utensils), a dairy thermometer, tablespoon, knife, and nipple and bottle brushes.

The bottles, filled with water, are scoured with soap and hot water by means of the

**Sterilizing
Utensils**

bottle-brush. After all adherent particles have been removed, the bottles are rinsed until clean, then filled and placed in the deep sauce-pan, which is half-filled with water. The nipples and stoppers are then scoured, rinsed, and placed in the pan, as are also the graduate, funnel, spoon, and knife. After the water has boiled for ten to fifteen minutes, it is poured off, and the hot contents of the pan are allowed to drain by being placed on a clean towel. The dry nipples are then transferred by the aid of the spoon to a clean tumbler.

**Preparing
the
Food**

The prescribed ingredients are mixed as directed and, unless otherwise specified, are boiled in a sauce-pan or covered double boiler the required length of time. When somewhat cool the required amount is poured into the proper number of bottles which are then sealed with the sterile stoppers or cotton. The bottles are then cooled rapidly and placed in the ice chest. After a little practice the food can usually be prepared within an hour, but care should never be sacrificed for speed. After the food has been prepared, the utensils are scoured, rinsed with hot water, and put in their place.

**Giving the
Bottle**

The hands should be washed before the bottle is taken from the ice-chest. The nip-

ple is put on without touching the upper part of the bottle or nipple. The food is then warmed by means of an electric bottle warmer or sauce-pan of warm water. The temperature of the food is best determined



Fig. 8.—Proper way of giving a feeding.

by allowing a few drops to fall on the inner side of the wrist. It should feel warm, not hot. The hole in the nipple is tested by inverting the bottle and gently shaking downward, when the milk should drop out readily—not stream out. If the hole is too small it

may be enlarged with a hot needle; if too large, the nipple must be discarded. A feeding should never require less than ten nor more than twenty minutes. Should the hole become "plugged" during a feeding, the bot-



Fig. 9.—Improper way of giving a feeding.

tle should be held upright in one hand and forcibly brought downward against the palm of the other. If the curd is not thus dislodged, another nipple should be used. The bottle must be properly held during the entire feeding. (Figs. 8 and 9.) Any food

left in the bottle at the end of twenty minutes should be discarded and the bottle filled with hot water.

While the main ingredient of an infant's food is usually milk (whole or skimmed milk, buttermilk, protein milk, peptonized, powdered, or goat's milk), other ingredients such as sugar, flour, or cereal are added. If sugar, flour, or cereal is prescribed by weight, an inexpensive letter-scale may be used. If the measuring is done by spoon, the same spoon should be used from day to day.

Ingredients

Two after-dinner coffeespoonfuls equal a teaspoonful; three teaspoonfuls equal a tablespoonful; two tablespoonfuls equal a liquid ounce.

Measures

The Table on page 94 gives the number of *level* tablespoonfuls to the ounce, also the weight of a teaspoonful and tablespoonful of various supplies.

The three sugars used most frequently are dextri-maltose, granulated (cane) sugar and milk sugar (lactose). A sugar is added to the milk mixture to increase its food value. Occasionally a proprietary "food" is used. Granulated sugar is usually too sweet, and milk sugar may be too laxative, especially during hot weather.

Sugars

NO. OF LEVEL TABLE- SPOONFULS TO THE OUNCE		1 LEVEL TEASPOONFUL WEIGHS ABOUT		1 LEVEL TABLESPOON- FUL WEIGHS ABOUT	
3	Dextri-Maltose	$\frac{1}{10}$ ounce	$\frac{1}{3}$ ounce		
8	Dry Milk	$\frac{1}{32}$ "	"	$\frac{1}{8}$ "	"
3	Milk Sugar	$\frac{1}{10}$ "	"	$\frac{1}{8}$ "	"
2	Granulated Sugar	$\frac{1}{8}$ "	"	$\frac{1}{2}$ "	"
$3\frac{1}{2}$	Protein Milk Powder	$\frac{1}{11}$ "	"	$\frac{1}{8}$ "	"
4	Wheat or Barley Flour	$\frac{1}{10}$ "	"	$\frac{1}{8}$ "	"
4	Rolled Oats	$\frac{1}{12}$ "	" (scant)	$\frac{1}{4}$ "	"
2	Rice or Pearl Barley	$\frac{1}{6}$ "	"	$\frac{2}{3}$ "	" (scant)
3	Farina	$\frac{1}{10}$ "	"	$\frac{1}{3}$ "	"

The flours of barley, rice, and wheat are seldom used before the second month. Partially dextrinized "patent" barley flour and rice flour are most easily digestible. Wheat flour, properly prepared may be useful in mild cases of diarrhea. Corn starch is seldom used before the second year. Soy-bean, rich in vegetable proteins, is occasionally used in the treatment of intestinal disorders. Cereals (farina, oats, corn meal, etc.), must be thoroughly cooked to be rendered digestible. Farina is the favorite gruel. It has a high nutritive value and contains mineral salts which are valuable in bone and tooth development. Cereals form an important part of the diet during the second half of the first and the first half of the second year.

**Flours,
Starches
and Cereals**

Recipes

Beef-juice is best prepared as follows: sear small pieces of lean round steak in a hot pan and run through a meat grinder that has been immersed in hot water. The ground meat is then put into a wet, boiled cheesecloth bag and the remaining juice expressed. After the expressed juice has been chilled, the fat should be removed and a little salt added. It may be poured over toast, zwieback, or mashed baked potato.

Beef-Juice

Two to four tablespoonfuls of beef-juice is usually sufficient. It is valuable for pale infants.

Broths

To prepare broth, half a pound of lean beef, mutton, or chicken, and a pint or more of water are cooked for two hours (water being added from time to time). After cooling, the fat is skimmed off and sufficient water added to make a pint. It is then strained. As broth has very little food-value, it should be thickened with cereal, bread crumbs, or potato. Like beef-juice and green vegetables, it furnishes elements valuable for growth.

Cereals

Cereals must be thoroughly cooked in a covered, double boiler; water, milk and water, or milk are used in their preparation. A little sugar and salt are usually added to make them more palatable.

Cereal Waters

To prepare cereal water, a level tablespoonful of barley, rolled oats, or rice is added to a pint of water and boiled an hour in a covered double boiler, strained, and enough boiled water added to make a pint. Patent barley flour is boiled only thirty minutes. Barley water is frequently used in place of other food for twelve or twenty-four hours in severe case of diarrhea, vomiting, or colic. Oatmeal water is frequently given

to breast-fed infants who have infrequent bowel movements.

To prepare custard, a level teaspoonful of sugar and an egg are beaten in a cup and sufficient milk is added to fill the cup. It is covered with a saucer, placed in a saucepan of boiling water for ten minutes, then cooled and placed on ice until served.

Custard

To make flour ball, four cupfuls of wheat flour are tied in a double cheesecloth or muslin bag, placed in two quarts of water, and boiled for six hours, water being added from time to time. The water is then thoroughly drained off. After several hours the cloth is removed, and the chalk-like center is broken into pieces and gently baked in an oven for two hours. This is then grated, sifted, and put in dry mason jars. Prepared flour ball may be obtained under the names of "Cereo" and "Old Holland Food." It is very nutritious, easily digestible, and is of particular value as a temporary diet for older infants who refuse to eat ordinary food.

Flour Ball

To prepare junket, a teaspoonful of essence of pepsin or a junket-tablet that has been previously dissolved in a spoonful of water is added to a half pint of luke-warm milk. After being mixed, it is kept warm

Junket

(double boiler) until firm, then put on ice until served. If plain junket is used, a drop of vanilla may be added.

Tea

To prepare tea for infants a quart of boiling water is added to a scant after-dinner coffeespoonful of tea leaves. This is allowed to steep until the water has a pale yellow tint, when it is strained. A saccharin tablet may be added. Some physicians use weak tea in place of barley water for twelve or twenty-four hours in cases of severe diarrhea, vomiting, or colic.

Artificial Food

The artificially fed infant usually thrives when the food given him is accurately adjusted to his individual requirements. The path with the least pitfalls is to have the physician make a complete physical examination of the child when the gain is less than four ounces a week. Several stools and a specimen of urine should be submitted. After a diet is prescribed a record should be kept of his progress. This includes the daily or weekly weight, the number and consistency of the stools and the amount of food refused or vomited. The progress should be reported to the physician at definite intervals so that the necessary changes,

increases, and additions to the diet can be made as they become necessary. Individualization is the secret of successful infant feeding. Every infant fed artificially needs and deserves individual attention. Advice of relatives, neighbors, and unscrupulous patent "infant food" concerns may produce permanent injury and should never be heeded. The day of generalized tables for infant feeding, and the era of complicated formulas, are things of the past. It is prudent to consult the physician as soon as the infant fails to thrive on the breast.

The artificial food usually consists of a certain amount of pure cow's milk, water, and sugar. Later on a flour or cereal is usually added.

HUMAN MILK AND COW'S MILK COMPARED

CONSTITUENTS	BREAST MILK	COW'S MILK
Fat	4. %	4. %
Sugar	7. %	4.5%
Protein	1.5%	3.5%
Salts	0.2%	0.7%
Water	87.3%	87.3%

This analysis shows that human milk contains about twice as much sugar, half as much protein, and a fourth as much of salts as does cow's milk. Attempts have been made so to modify cow's milk as to make it

contain these ingredients as they occur in human milk. Such modification is intricate, to say the least.

Infants under ten pounds usually thrive on protein milk containing 3 per cent or more of dextri-maltose. If cow's milk mixtures are given, they must be weak at first and strengthened as the child grows older. A half milk, half barley water mixture containing a sugar is usually satisfactory until the third or fourth month, when the proportion of milk is gradually increased. During the sixth or seventh month, one or two cereal feedings are usually given, and a small amount of vegetable is frequently added. Infants past four months should be given orange juice daily when the bowels are not loose. In case of constipation after the eighth month, a few ounces of unsweetened prune juice may be given daily.

Mixed Feeding (Breast and Bottle)

Mixed feeding, properly conducted, does not endanger the breast milk supply, even when the child gets relatively little from the breast. The occasions where it is resorted to are:

1. If the breast milk supply is insufficient.
2. If the duties of the mother take her

away from her child for many hours of the day.

The two methods available are:

Methods

1. To give the artificial food in the bottles immediately after one or more nursings (Complemental Feeding).

2. To give one or more bottles in place of the breast (Supplemental Feeding).

Complemental feeding is the ideal method if artificial food must be used. By weighing the infant before and after each nursing for a day or two, the necessary amount of complemental food is determined.

Complemental Feeding

If the infant fails to gain on complemental feedings, then supplemental feeding is usually resorted to. If two or more bottles are substituted for nursings, both breasts should be emptied at the other feeding periods. The breast supply is usually endangered when supplemental feeding is resorted to. Mothers are usually willing to nurse their infants indefinitely if one bottle is given about the fifth month. The best time of day to give this bottle is at two or six P.M. If the food is properly prepared (sufficiently weak) and both breasts are given at the next nursing (at six or ten P.M.), the supply is seldom impaired before the child is

Supplemental Feeding

ready to be weaned. Giving a bottle at five months makes subsequent weaning relatively easy.

The age at which mixed feeding is begun, the condition of the infant, and the time of year are factors that receive the physician's attention when artificial food is prescribed. The child should not be able to get the artificial food too easily nor should the food be too sweet, as the child may develop a preference for the artificial food and take the breast very reluctantly.

Rules for Infant Feeding

The following rules will guide the mother or nurse in avoiding and detecting gross errors.

1. Artificial feeding must never be begun before it is necessary, but when necessary, valuable time should not be lost.
2. The physician's orders must always be adhered to.
3. The infant must be fed regularly, being awakened for his food, if necessary.
4. The food must be warm, and the bottle must be held during the feeding, which should never require more than twenty minutes.

5. After gas has been allowed to escape by holding the child over the shoulder, he should be put into the crib and left there for at least several hours.

6. Used nipples must be turned inside out, cleansed, boiled, and kept in a clean, dry tumbler.

7. The used bottle should be immediately rinsed and filled with hot water.

8. Overclothed infants perspire and get colic or catch cold very easily.

9. Colic, diarrhea, or fever require a decrease of food and the physician's advice.

Calories and Tolerance

The average infant of a certain age and weight, requires, theoretically, a definite amount of food daily to maintain the body functions and to gain properly. Sugars and fat serve as fuel and are burned, whereby body heat and energy are liberated; the proteins on the other hand, serve for growth and repair. The amount of inherent heat or energy of all foods is known; the unit of measure is called a calorie. Each ounce of food represents a definite number of calories; for instance, an ounce of human milk or cow's milk contains twenty-one calories, an ounce of any of the sugars about

Calories

a hundred and twenty, and an ounce of flour, starch, or cereal, about a hundred.

Painstaking observations have shown that to thrive, the average newly born needs for each pound of his weight about forty-five calories in twenty-four hours; older infants usually require forty calories; whereas the minimum to maintain life is about thirty calories per pound in twenty-four hours. Infants much underweight may need sixty or more calories for each pound of weight. A specific example may serve to illustrate the method pursued in calculating an infant's food requirements. An average ten pound infant requires about four hundred and fifty calories each day. As an ounce of breast milk contains twenty-one calories, he will need about twenty-one ounces of breast-milk in twenty-four hours. This amount would be consumed in five feedings of four ounces each. This is the equivalent of two ounces of breast milk for each pound of weight in twenty-four hours. If the infant is artificially fed, fifteen ounces of cow's milk, fourteen ounces of water, and about three level tablespoonfuls of dextri-maltose are theoretically the optimum proportions. About one and a half ounces of cow's milk for each pound of weight serves as a guide

in determining the necessary amount of cow's milk. The quantity of additional carbohydrate is usually estimated at three or more per cent. The number of calories per pound in twenty-four hours on such a formula is estimated as follows:

Milk — fifteen (ounces) times twenty-one	
(calories)	= 315 calories
Water	= 0
Dextri-Maltose — 3 level tablespoonfuls	
	= 120 calories
divided by ten (pounds) equals forty-	
three and a half calories per pound in	
twenty-four hours.	

Food Tolerance

Healthy infants usually have a wide food tolerance (capacity for food); that is to say, the quality and the quantity of food given in twenty-four hours may vary within relatively wide limits without causing nutritional disturbances. An infant who has been underfed for a long period of time or who has been ill often has a decrease in food tolerance. Gross errors in feeding cause diarrhea, vomiting, and other serious disorders because they overstep the food tolerance of the individual. A fever caused by an earache, bladder infection, tonsillitis, etc., or an extremely hot day, too much clothing or too many covers, may cause a decrease in

food tolerance. An "overstepped" tolerance is very slowly restored; in fact, skill and patience are necessary to avoid a further decline. Increasing artificial food rapidly, especially during hot weather, is hazardous.

**Successful
Artificial
Feeding**

The healthy infant is happy and content. He should take all of the food, sleep comfortably, and gain consistently a little more than a pound a month. There should not be much if any regurgitation, and the bowels should not move more than twice a day. If the bones and teeth develop as they should and the weight reaches fourteen pounds at five months and twenty pounds at a year, the feeding has most likely been successful.

**Errors in
Feeding**

Nervousness and overanxiety of mother or nurse will handicap even a normal infant. Harm may result if the little things are not done accurately. Using "rounded" spoonfuls of food, adding a "good measure" of milk, or adding a pinch of sugar to the drinking water are common errors which may have grave consequences. A gain of eight ounces or more a week for an infant past four months whose weight is not very much below par is not desirable. Overfeeding, even with properly prepared food, often leads to serious intestinal derangements.

On the other hand, insufficient quantities of a proper food may cause an insufficient gain or stationary weight.

The great increase in infant ills and deaths during hot weather is not solely dependent upon the quality of the milk. Food is only one of a number of factors which act on the infant organism at this time of the year. Heat regulation of the body deserves close attention. Clothing should keep the body only comfortably warm. The quality and quantity of clothing must be adapted to climate, season, and room-temperature. It must be borne in mind that wool and silk inhibit heat loss through radiation and conduction much more than do cotton and linen. Excessive clothing on hot days or in hot rooms disturbs the heat regulation of the body and may cause serious disturbances in the body functions, especially those of the digestive tract. The adult adjusts his clothing to the feeling of comfort, while the infant, in whom the question of heat regulation is much more grave, must rely upon the judgment or whim of the caretaker. Sleeplessness, fretfulness, colic, and diarrhea are often the result of excessive heat or too much clothing. Many of the ills of summer can be avoided by proper diet, clothing, and care. On hot days

**Hot Weather
Care**

the amount of food must be reduced, and plain boiled water should be given several times daily. Clothing should be thin and loose, the room should be kept cool by proper ventilation; frequent baths may be necessary, and the food must be boiled and kept on ice. Any intestinal upset should be reported to the physician.

**Vacation and
Travel**

Traveling with an infant under a year is, occasionally, a necessary evil. Artificially fed infants, especially those who have had any nutritional disturbances, are extremely poor travelers. A change of abode is permissible, however, if the infant is to be taken to a cooler climate during July, August, and September, provided the accommodations and milk supply are irreproachable. A frequent cause of trouble is giving milk which is richer in cream than that to which the infant is accustomed. Before leaving home the depth of the cream ring of a quart bottle of milk should be measured and the milk from which the infant's food is to be prepared should not show more. In case of doubt, most of the cream should be removed and then gradually added from day to day. Young, artificially fed infants usually thrive best at home. If the mother needs a rest or change, it is often advisable

to leave the baby at home with a reliable, trained infant's nurse, while the mother recuperates at the seashore, mountains, lake, or in the country.

Should circumstances necessitate a journey with an artificially fed infant, a twenty-four or thirty-six hour supply of food should be taken along. The sterilized, tightly corked and labeled bottles must be kept cold; they may be given to the dining-car porter to be placed in the refrigerator. Small portable ice-boxes are cumbersome and need frequent filling with ice. They are, however, indispensable on some occasions. If pure milk is not available en route or at the place visited, dry milk or evaporated milk should be taken along. Such milk should be properly diluted with boiled water as needed. Thermos bottles are quite satisfactory for keeping drinking water warm and for keeping food cold. They must be thoroughly cleansed before use.

Infants should never be unnecessarily exposed to disease. One child with beginning whooping cough or measles may start an epidemic. Baby "shows," birthday parties, and picnics are frequently followed by outbreaks of such diseases.

**Baby Shows,
Parties,
Picnics**

Feeding During the Second Year

Most year-old infants are able to digest boiled whole milk. The infant of twelve months usually eats cereal, vegetable, and fruit juices without any trouble. The cereals may be cooked in water or milk. Infants seldom relish broths and exceptional skill and patience are often necessary to feed them. Broths may be thickened with well cooked vegetable, cereal, potato, or bread crumbs. The average infant seldom gains more than six pounds during the second year.

Diet from 12 to 18 Months

6 to 7:30 a.m.

Eight to ten ounces whole milk; one-half slice of toast, or a piece of zwieback.

9 a.m.

One to two ounces of orange juice in an equal amount of water may be given, if the bowel movements are not loose.

10 a.m.

(1) Six to eight ounces of beef, mutton, or chicken broth containing one and a half tablespoonfuls of farina, rice, pearl barley, or a grated potato (See Recipes).

Or

One to two ounces of beef juice (See Recipes) with two to three tablespoonfuls of mashed baked potato (to which a little salt and pasteurized butter have been added).

(2) Spinach, carrots, green beans, or peas. Any one of these vegetables can be given in amounts up to three tablespoonfuls. (Vegetables must be well cooked in very little water and passed through a sieve.)

(3) A piece of buttered toast or zwieback and four ounces of milk.

2 p.m.

Feeding same as 6 a.m.

6 p.m.

(1) Cereals: two to three tablespoonfuls of farina, barley flour, arrowroot, tapioca, cornstarch; if constipated, Wheatena, Ralston, or Pettijohn. (Cereals should be cooked for at least an hour in a covered double boiler in 8 to 10 ounces of milk, and a level teaspoonful of sugar and a pinch of salt.)

(2) Apple sauce, baked apple, or prune pulp. Two to four tablespoonfuls of any one of these can be given, to be discontinued if bowel movements are loose.

All milk should be boiled; all food must be minced or finely divided. The milk may be given from a bottle, other food from a spoon. The child should never eat between meals, nor should he go to bed later than six or seven o'clock.

Diet from 18 Months to 3 Years

Breakfast
7-8 a.m.

1. One egg (coddled or soft boiled), or a bowl of cereal (two level tablespoonfuls of farina, rice flour, barley flour, oatmeal, cornmeal, Wheaten, or Pettijohn cooked at least an hour in one-half cup of milk and one-half cup of water).

2. One (later two) slices of bacon (not too crisp) may be given three or four times a week.

3. Zwieback, toast, or stale bread, graham or soda crackers (spread with a small amount of pasteurized butter).

4. A cup of boiled milk or very weak cocoa.

Noon Meal
12-1 o'clock

1. Six ounces of beef, mutton, or chicken broth thickened with cereal or toast crumbs may be given several times a week.

2. White meat of chicken, broiled lamb chop, or minced beef-ball. About two tablespoonfuls of meat may be given.

3. Baked potato (seasoned with a little salt and butter); or two tablespoonfuls of well boiled rice or macaroni.

4. Vegetables: well cooked spinach, peas, green beans, carrots, asparagus tips, stewed celery, squash, beets, or cauliflower. (Vegetables are to be minced and may be seasoned with a little salt and butter.)

5. Dessert: gelatin, bread pudding, corn starch, tapioca, custard, or junket. (See Recipes.) Milk need not be given at this meal.

1. Bowl of cereal (farina, rice, barley, oatmeal, cornmeal, Wheatena, or Pettijohn, cooked for at least an hour), or 8 ounces of a creamed soup (pea, tomato, potato, etc., cooked with milk, flour, butter, and salt).

Supper
6-7 p.m.

2. Zwieback, toast, or stale bread (spread with a small amount of pasteurized butter and honey), and a cup of boiled milk or very weak cocoa.

3. Finely divided stewed fruit: apple sauce, prune pulp, peaches, pears, or apricots.

The eighteen months old infant should be given only three meals a day. The various foods must be cautiously increased as age advances. He should be taught to eat slowly and to masticate his food. Eating

Second
Summer

between meals should not be tolerated. "Prepared" breakfast foods, pies, nuts, berries, bananas, candy, and sweets such as cake and ice-cream should not be given. Egg, meat and dessert should at first be given only three times a week. Milk and drinking water should be boiled. Well cooked creamed vegetable soups are very nutritious. The only fruit of the day should be given with the evening meal. If these precautions are observed, the second summer need not be feared.

The Undernourished Older Infant

If a child of twelve, eighteen, twenty-four months, or older, is ten or more per cent below weight for his height and age, the parents should have the physician ascertain the cause. Infants much underweight seldom gain if fed the routine diet, and special diets are often necessary. When the underlying cause has been discovered, it is the task of mother and nurse to cooperate with the physician. Errors in diet (improper foods), errors in feeding (letting the child decide which food he wishes to eat), insufficient rest (no naps, up too early and late), adenoids, tonsils, con-

stipation, and other factors frequently handicap the development of young children.

A careful record of the quality and quantity of food eaten, and a daily estimate of the calories consumed is a valuable aid in determining whether a child eats proper and sufficient food for growth. The average child requires about 40 calories per pound per day; the underweight appreciably more.

The following table gives the amounts of various foods necessary to make a hundred calories:

100 CALORIES ARE CONTAINED IN:

Apple Sauce	3	tablespoonfuls
Bread	1	full slice
Broth (thick)	5	ounces
Butter	1	tablespoonful
Buttermilk	10	ounces
Crackers		
Graham	4	
Oyster	20	
Soda	4	
Cream	2	ounces
Dextri-Maltose	3	tablespoonfuls
Egg	1	large
Farina	2	tablespoonfuls
Meat	1	chop
Milk (whole)	5	ounces
Milk (skimmed)	9	ounces
Olive Oil	1	tablespoonful
Orange	1	large
Potato	1	average
Puddings	2	tablespoonfuls
Soup (creamed)	4	ounces
Sugar	1½	tablespoonfuls
Zwieback	3	

CHAPTER V

NUTRITIONAL DISTURBANCES OF THE ARTIFICIALLY FED INFANT

Improper feeding of the artificially fed infant is the cause of many ills. The mother who can provide excellent care for her offspring and who conscientiously follows the advice of her physician may usually be spared most of these troubles. Even under ideal circumstances, however, the hazards for the artificially fed are greater than for the child on the mother's breast.

The delicate digestive apparatus of most infants can usually take care of artificial food if it is properly prepared and cautiously fed. Disturbances are nearly invariably due to improper food, unwholesome food, or faulty feeding technic. The quality and quantity of the food and the feeding intervals are the three factors which deserve most careful attention. The earliest symptoms of nutritional disturbance are usually mild. If they are recognized and the cause removed, the more serious conditions seldom develop. Vomiting, colic, and diarrhea, frequent manifestations of alimentary disturb-

ance, may be preceded by fretfulness, restlessness, and crying.

Abdominal pain caused by air in the stomach or gas in the intestine is often the result of fermentation of food. It is brought about by overfeeding, improper food, or faulty feeding technic. Enemas and suppositories may give temporary relief, but the cause must be removed in order to bring about a permanent cure.

Colic

Regurgitation or "spitting up" a small amount of food shortly after a meal may signify that air was swallowed before or during the feeding. If the infant is properly held over the arm or shoulder immediately after the feeding the air is readily expelled. Too rapid feeding, improper handling, or overfeeding may also cause regurgitation. Recurrent vomiting must be remedied by removing the cause. Forceful (projectile) vomiting, when accompanied by an insufficient gain or a loss in weight, may be a symptom of a serious disease of the stomach and usually needs expert advice early. In some instances surgical measures may be necessary to save the child's life. This disease also occurs in breast fed infants.

**Regurgitation
and Vomiting**

**Pyloric
Obstruction**

The artificially fed infant should not have

Diarrhea

more than two stools a day. When there are more than four in twenty-four hours, the cause must be sought, as artificially fed infants seldom gain properly when the bowels move frequently. Overfeeding, keeping the baby too warm, or an intercurrent disease (tonsillitis, common cold, bladder inflammation, etc.) may be the underlying cause. The amount and the strength of the food should be reduced at the onset of diarrhea. In severe cases, barley water or weak tea should be given for twelve or twenty-four hours. The physician should be notified at once so that proper measures may be instituted. Diarrhea seldom lasts more than a week if proper measures are taken early. The return to the normal diet must be gradual so that a recurrence will be avoided.

**Reaction to
Cow's Milk**

It is wise to give only a teaspoonful of the milk mixture the first time an infant is given artificial food, as occasionally infants react very peculiarly to cow's milk (fever, vomiting, diarrhea). If no such reactions occur within a few hours, the prescribed quantity may be given without concern.

Weight Disturbance

This rather mild nutritional disorder is not uncommon. The weight, after fluctuating

for some weeks, becomes more or less stationary. As time goes on, the growth becomes impaired. Infants thus affected are often receiving a mixture of cow's milk, relatively rich in cream. They are more or less restless, pale, flabby, and thin, but not very much emaciated. The stools are usually gray and formed. The condition responds rapidly to proper treatment.

Dyspepsia

This is due to intestinal fermentation, frequently the result of overfeeding with one or more food constituents. The infants suffer from diarrhea, colic, and vomiting. The stools, usually more than three a day, are more or less green and foamy and contain mucus and curds. As their tolerance for food is low and increases slowly, these infants usually do well if given barley water or weak tea for twelve or twenty-four hours, followed by weak milk mixtures which are strengthened from time to time. Breast milk or protein milk usually gives good results in obstinate cases. Intelligent increase of the food is necessary not only to avoid a recurrence, but also to avoid underfeeding. Laxatives and enemas should be used only when the physician orders them.

Atrophy (Marasmus)

This chronic state of malnutrition called atrophy is due to a severe impairment of digestion. The extremely emaciated infant fails to assimilate food properly. The weight loss may be slow during the first few weeks. The skin appears somewhat gray, the lips rather pink. The child seldom cries, often sleeps well, and has a good appetite. The stools may be quite normal in appearance and frequency, or there may be periods of diarrhea and constipation. The infant fails to gain, the temperature is often subnormal, and bronchopneumonia in winter or "summer complaint" during the hot weather are serious complications. The sooner these infants receive proper treatment, the better are their chances for recovery. Breast milk is usually necessary. Intelligent nursing care (see Prematurity, page 67) is necessary to exclude infection, subnormal temperature, overheating, and collapse. The younger the child the more serious the outlook.

Alimentary Intoxication

(Summer Complaint, Cholera Infantum)

This very serious condition has an acute onset with fever, diarrhea, vomiting, deep

breathing, and more or less listlessness. It occurs most frequently in summer, in artificially fed infants of the tenement and rural districts. It may be preceded by one of the above described disturbances of nutrition or may be induced by excessive heat or possibly contaminated food. In the more severe cases the eyes are sunken and half open and have a characteristic stare. The great loss of fluids through the bowels and vomiting makes it imperative that the extremely sick infant receive immediate attention of the proper kind. The child should be transferred to a hospital where measures may be instituted to replenish the water loss. Lavage, rectal feedings, and other measures are usually necessary to save the child's life. Discretion in diet must be exercised for years after the child has recovered.

Rickets

This disorder of nutrition, characterized by a disturbance in mineral metabolism, manifests itself to a great extent in the bone-development of infants. The changes become most apparent at those parts where the long bones grow—at the wrists, ankles, and ribs below the nipples. The fontanelle is usually late in closing and the teeth often

appear late and singly instead of in pairs. The infant perspires easily and walks late. Although the condition exists in all possible degrees, it is seldom serious. It occasionally leaves its traces by distorted contour of trunk, legs ("bow-legs" and "knock-knee"), or pelvis (the latter in girls may add to difficulty in labor during childbirth later in life). Fractures of bones occur with surprising ease and frequency. Few diseases show such marked improvement as does rickets when proper treatment and diet are adhered to. Phosphorized cod liver oil, green vegetables, fresh air, and sunlight not only cure rickets, but also prevent it.

Tetany

Recurrent convulsions during infancy or early childhood are usually due to *tetany*, a condition possibly allied to rickets.

Laryngospasm

A spasm of the larynx causing a crowing sound is a serious type of convulsion; the child nearly suffocates and gets pale until the spasm relaxes. The first thing to do in case of convulsion is to send for the physician. In the meantime the child may be given a warm bath or mustard pack. (See Convulsions, page 133.)

Scurvy**Scurvy**

Scurvy is less frequent than rickets and quite different in its manifestations. It oc-

curs most frequently during the first two years of life, especially after the sixth month. It is more frequently encountered among babies fed exclusively on boiled milk or cooked cereals. The first symptom most frequently noticed by the mother is that the child cries when picked up, or when his legs are grasped rather firmly. Dark blue hemorrhages in the gums are usually found. Orange juice must be given daily; also green vegetables and a mixed diet if the infant is past eight months.

CHAPTER VI

SOME COMMON AILMENTS

The healthy infant is usually happy and content, being companionable and seldom out of sorts. When awake, he is always active, kicking his feet and tirelessly waving his hands. As soon as he is not well, his disposition changes: he is no longer playful, becomes fretful, his smile vanishes, and he usually refuses to take all his food. The mother often knows that things are not as they should be some time before the seat of the trouble is discovered. When the smile returns one can feel quite certain that things are on the mend, even though the physical condition of the young invalid is still far from normal. His disposition keeps pace with his improvement, and when his appetite is completely restored he is usually quite well again.

Lowering Resistance

The nose and throat may harbor germs which are relatively harmless as long as the individual's resistance is normal. Healthy breast fed babies who are well cared for seldom get sick. When the protective substances in the blood fail to act or are not sufficiently replenished, germs gain a foot-

hold and an infection gets started. Resistance in infants is lowered chiefly in the following ways:

1. Breathing dry, overheated room air.
2. Chilling by being dressed too lightly or by exposure to drafts.
3. Sudden changes in temperature, especially when perspiring.
4. Insufficient sleep.
5. Improper food and care.
6. Constipation or diarrhea.
7. Insufficient fresh air and exercise.
8. Intercurrent disease (rickets, adenoids, diseased tonsils, etc.)

The common cold is the most prevalent illness, because it is the most contagious. It is, without doubt, the most important of the acute infections during infancy, for from it a dozen or more serious respiratory conditions may develop. It is an inflammation of the mucous lining of the nose and throat. Sneezing or a congestion of the air passages may be the first symptom. This may be followed by a profuse, watery nasal discharge which later on becomes thick and yellow, resembling pus. A so-called "cold" may also be the first sign of measles, whooping cough, or diphtheria in infants. The

**The Common
Cold**

younger the child, the more likely will complications arise.

Colds are "caught" in one of the following ways:

1. Direct contact (kissing, fondling).
2. By being within a yard of a person with a cold (when he talks, sneezes or coughs).
3. Indirect contact (using the same handkerchief, towel, or cup that somebody with a cold has used).

**Treatment
for Colds**

The child should be put to bed and kept there until the temperature has been normal for at least two days. The room should have an even temperature during this time—preferably about 68° to 72° F. If the temperature gets above 75° F. the air becomes too dry and acts harmfully by drying the mucous membrane of the nose and throat; if below 50° or 60° F., it will often aggravate a cough. The physician should be consulted. The rules for isolation should be enforced if only one of two or more children contracts a cold. The diet should be reduced, the amount of water increased.

If an adult with a cold must take care of an infant, a face mask (four layers of gauze) should be worn over the nose and mouth. (See Fig. 6.) If possible, a person with a

cold should refrain from coming near an infant, as serious complications may develop when an infant contracts a cold.

A cough is a reflex action due to an irritation in the throat. The throat or pharynx may be the seat of an infection or inflammation, or the cough may result from nasal secretions flowing into the throat. Coughs are usually aggravated when the child lies on his back. A compress to the neck, local and internal medication may be necessary. In case a cough lasts longer than ten days and comes on in attacks, one should think of whooping cough. A blood count may aid in early diagnosis.

Cough

There are two kinds of croup. The one is harmless, the other is a form of diphtheria. The physician should be summoned early so that cultures or other measures may be taken. The harmless type is here described. There may be a slight nasal discharge or hoarseness toward evening. After a few hours of sleep the infant awakes with a barking cough. About midnight the cough gets worse; the cry is hoarse; there is shortness of breath, inspirations are difficult and noisy. The attack usually lasts an hour or more, after which the child may go to sleep. The next day the cough and

Croup

hoarseness are usually slight, but that night the attack may recur. An attack is usually more alarming than dangerous. During the spell, hot compresses to the throat, changed every fifteen minutes, may give relief; one grain of antipyrin may be given in warm orange juice every few hours. Steam inhalations, taking the child to the bath room (where hot water is kept flowing) may be of service. Simple, inexpensive "croup kettles" can be had at most druggists. Vomiting need not be resorted to unless the attack is very severe. For this, ipecac is sometimes used.

Bronchitis

When the mucous membrane lining the bronchial tubes is the seat of inflammation, we speak of bronchitis. Wheezing in the chest is more or less audible. Bronchitis may be preceded by croup. The physician should be called. Counter-irritation of the chest such as mustard-packs, camphorated oil inunctions and internal medication usually bring relief within a week.

Pneumonia

There are two types of pneumonia: bronchopneumonia and lobar pneumonia.

The former is more common in infants who have been ill with measles, whooping-cough, or other diseases which decrease resistance. The irregular fever often lasts

weeks. It is one of the most serious conditions of infancy.

Lobar pneumonia usually begins quite suddenly with a high fever, cough, and "grunting" respiration. The fever is more or less high until the crisis, which usually occurs between the third and the eighth day. The child appears very ill.

Pneumonia requires intelligent nursing care. The fever is usually counteracted with packs, sponging, and the frequent administration of water.

Frequent complications of the common cold and other respiratory ailments are the involvement of the naso-pharynx, tonsils, and middle ear. Recurrent colds often produce adenoids which, when once established, become the source of repeated colds. Tonsils which have become the seat of chronic infection, harbor germs which may, in time, cause valvular heart disease, rheumatism, St. Vitus' dance, and other serious disease. Middle ear disease is a relatively common source of high fever in infants. The pain may be severe. If the infection causes the drum-membrane of the middle ear to bulge, the abscess usually ruptures of its own accord or may require puncture by the physician, so that the pus may escape from the

Adenoids

**Diseased
Tonsils**

**Middle Ear
Disease**

Mastoid

middle ear. The treatment for discharging ears is variable. Borated vaseline applied to the outer ear and cheek when the discharge is profuse may prevent soreness of the skin. Diseased tonsils and adenoids often need surgical removal. When the infection of the middle ear spreads to the porous bone behind the ear (mastoid) surgical measures are usually necessary.

Glands

The glands of the neck may become acutely or chronically enlarged in acute or chronic conditions of the throat and require a physician's attention. Chronically enlarged glands of the neck are sometimes tubercular.

Genito-Urinary System

**Kidney and
Bladder
Infections**

One of the most common and obstinate conditions occurring in infancy is inflammation of the bladder or kidney. The only way this condition can be diagnosed is by a microscopic examination of a fresh specimen of urine. When an infant has a fever, diarrhea, or stationary weight, or if the child is pale, a specimen of urine should be submitted to the physician at the time the child is examined. Urine analyses are as important in infants as in older patients. (See CHAPTER VII for methods of collecting

specimens.) In some of the severe cases the temperature is extremely high. Medical treatment must often be continued for weeks or months—until the urine is free from pus. Recurrences are rather frequent. A sudden cold, high fever, constriction or swelling of the penis may cause infrequent urination or urine retention. The infant should be given copious quantities of water sweetened with saccharin and a warm wet towel should cover the lower part of the abdomen and genitals. Drugs or catheterization are seldom necessary.

When an infant is a few days, weeks, or months old, there may appear an unusual swelling in the navel or genital region. If it gets larger when the child coughs or cries, it is probably a *rupture* (hernia). A protruding navel should be properly strapped with adhesive plaster for months. A hydrocele, a collection of fluid in the scrotum, is seldom cause for alarm and usually disappears spontaneously in the course of months or years. “Hidden” or undescended testicles seldom need attention during infancy.

Rupture
Hydrocele

Boys are usually circumcised as soon as the birth weight is regained, that is, some time after the tenth day. At this age an anesthetic is unnecessary and healing is usu-

Circumcision

ally rapid. When older infants with tight or long foreskin require circumcision, it should not be done in summer or winter.

Vaginitis

A profuse vaginal discharge deserves the immediate attention of the physician. If due to gonorrhea, it is highly contagious and needs prompt isolation and persistent treatment.

Nervous System

The Nervous Baby

Some infants are more or less nervous. They are restless, their sleep is not sound, they cry easily, and lie awake for hours before going to sleep. Nervousness may be inherited from a parent or grandparent, but it usually is the result of improper feeding, lack of routine, or rickets. Some of the more common nervous manifestations encountered in infants are here considered briefly.

Bad Habits

The first "bad habit" to be acquired is usually *thumb-sucking*. If the habit is not broken early, the teeth may not grow in straight or infections about the nail may occur from time to time. The sleeve should be tied so that the hands are included; later on, a mitten or adhesive plaster may prove effective. Pinning the sleeve to the mattress may also be resorted to. *Night terrors*, in which the child awakes crying hysteri-

cally, are seldom encountered during infancy. If they occur, the child should not be punished, but assured that nothing is wrong. While many children of two years go through the night without *wetting* the bed, those who do not need further discipline in this respect. The evening meal should contain very little fluid and very little or no water should be given during the night. They should be taken up about 10 P.M. and on awakening in the morning. The stool and urine should be examined. "*Masturbation*" may occur very early. It is usually accomplished by thigh friction or rubbing against the covers or pillow. When it is discovered the physician should be told about it. The condition is somewhat more common among girls than boys. Close watch and restraint when going to sleep are usually necessary for weeks or months. If these measures are without avail, circumcision may prove effective.

Bed Wetting

Convulsions in the newly born may be due to hemorrhage within the skull. In older infants these attacks may be associated with gastrointestinal disturbance, or may precede an acute illness such as meningitis, measles, pneumonia, or tonsillitis. If convulsions recur, the child is usually suffering from tetany. The physician should be called

Convulsions

at once. Before he arrives the child may be given an enema and cold cloths should be applied to the head. He may be put in a warm mustard pack for twenty minutes, after which the skin should be red.

The Skin

The upper layer of skin of the newly born normally peels off some time during the first two weeks. The skin of infants is extremely sensitive and needs careful daily attention.

Chafing

Chafing, the result of local irritation of the skin, is so frequently encountered because so many factors may cause it. The most usual are: insufficient boiling of napkins, rubber napkins, irritating stools, infrequent changing, improper cleansing of buttocks, intestinal disturbances, urinary infection, too much cream in the food and overfeeding. Using a mild soap and water, followed by the liberal application of zinc oxide ointment or Lassar's paste several times a day, usually effects a cure if the cause is removed. All clothing and bedding which has a strong odor should be boiled in a covered pail of water for fifteen minutes.

Prickly Heat

Prickly heat, the result of overheating, may occur in winter or summer. It is usually due to wool or too much clothing. Re-

moving the cause, sponging with soda water (one tablespoonful of baking soda to a pint of water), and then using stearate of zinc dusting powder freely will cause the irritation to disappear.

Hives can usually be attributed to an intestinal "upset." The patches or wheals are more or less elevated, smooth, flat, pale or red. They come and go rather suddenly, increase rapidly, and itch. A baking soda enema (one tablespoonful of soda to a quart of warm water), a small dose of milk of magnesia once or twice a day, and a reduction in diet usually help. In case of severe itching, wet dressings of baking soda solution (one tablespoonful to a pint of water) bring relief. Eggs, strawberries, antitoxins, etc., may cause this condition in susceptible individuals.

Hives

Eczema is the most frequent and most obstinate inflammation of the skin occurring during infancy. It is encountered among breast-fed as well as bottle-fed babies. Though a predisposition to this condition exists, there are a number of external and internal factors that influence it. Under the former may be mentioned: strong soaps, woolen clothing, hot or cold weather, and lack of care resulting in skin infection. Un-

Eczema

der internal factors, constipation, digestive disturbances, improper diet, and overfeeding are the most frequent. Soap and water are usually harmful; olive oil, mineral oil, ointments, and lotions are used. The results obtained may depend upon the patience and care with which the treatment is carried out. Cradle-cap may be the first sign of eczema. It consists of yellowish scales in the region of the fontanelle. By the application of vaseline twice a day and the use of a fine baby-comb, the crusts can usually be removed. The attention of the physician should be called to this early symptom. By the elimination of the factor which is inducing the disease, the more advanced stages of eczema may be avoided.

Cradle-cap

Contagious Diseases

Quarantine

It is the duty of every one to assist in the enforcement of quarantine in any case of disease that spreads by contact, particularly such diseases as scarlet fever, smallpox, infantile paralysis, epidemic meningitis, diphtheria, measles, whooping-cough, chicken-pox and mumps. Any household afflicted with such a disease renders a valuable service to the community by co-operating with the health authorities. Epidemics often

arise by allowing a "mild" case to mingle with healthy children. A "suspicious" case should be kept isolated until the authorities make a diagnosis.

The best isolation and care for the first five diseases mentioned above are obtained in a contagious disease hospital. When the patient is taken care of in the home, the following brief outline may be of some assistance.

The quarantined rooms should be well isolated from the rest of the house. A room or two on the top floor is ideal if heat, flowing water, and bath room facilities exist. The nurses are quarantined with the patient, and should sleep in a room adjoining that of the patient. Scarlet fever cases should preferably be nursed by a person who has had the disease. Food, clothing, and supplies for the quarantined should be left at their door. Soiled linen and used dishes should be disinfected by immersion in lysol water or bichloride of mercury solution overnight, after which they should be placed in a pail which is kept outside the door. The nurse and all who came in contact with the child before he was quarantined should gargle and use a nasal spray. The nurse should wear washable clothes, a face mask, and a

**Quarantine in
the Home**

close-fitting cap. The physician leaves his coat outside the sickroom and puts on a long well-fitting gown, cap, and mask before entering. These and a basin of disinfecting solution should be placed just outside the door. The parents are obliged to provide safety for the nurse and physician. It is the duty of the latter to insist that the rules of quarantine are enforced. When the quarantine is raised, the patient should have at least two "discharge" baths—the entire body being thoroughly cleansed with antiseptic soap and water and then sponged with a solution of lysol or bichloride of mercury. Every particle of clothing should be changed, and after the second bath the child is taken from the room. The nurse then disinfects everything washable, and possibly prepares the room for fumigation. Mattresses, pillows, etc., are sterilized by some health departments. Where such facilities for sterilization do not exist, the bedding, if valuable, should be sponged with bichloride of mercury solution and then exposed to the sun and fresh air for days. The nurse must change her clothing and disinfect her hair, face, and hands. Fumigation is not as effective as was formerly believed. Washing the walls, floors and furniture with

antiseptic solutions is probably more effective.

A child with vomiting, headache, sore throat, and fever should be isolated until the physician has made a diagnosis. The distinctive rash usually appears first on the neck and chest, and then spreads over the trunk and extremities. By early isolation, spread of scarlet fever can be prevented. Mild cases are often atypical and are diagnosed with great difficulty. All cases must be kept in strict quarantine for at least five weeks. If desquamation (peeling) or discharges from ear, nose, or glands are present at the end of this time, longer quarantine must be maintained. In uncomplicated cases the temperature is usually normal within a week. As subsequent kidney complications may arise, a specimen of urine should be sent to the physician from time to time for several months. Diphtheria is occasionally a complication. One attack of scarlet fever usually confers immunity.

Scarlet Fever

Infants under five months seldom contract measles. It is highly contagious in the early stage, even days before the rash appears. The first symptoms may be those of a cold; later the eyes become inflamed and the nasal discharge becomes more profuse. The child

Measles

shuns the light, the cough gets more hoarse, and the fever increases until the rash is at its height. A diagnosis can often be made several days before the rash appears, as the small white spots which appear on the mucous lining of the cheeks ("Koplik spots"), are characteristic of the disease. The rash usually appears first on the face and neck and then spreads over the trunk and extremities. Measles patients should be kept warm, their eyes and nose need careful attention, and strong light should be avoided. The quarantine lasts about two weeks. As measles may prove to be serious during the first few years of life, everything should be done to prevent young children from contracting it.

**Prevention
of Measles**

By injecting into a young child within four days after exposure 5 c.c. or more of blood serum from a child who has completely recovered, the disease can be prevented. When children between five months and three years have been exposed, they should, whenever possible, receive this prophylactic treatment sufficiently early.

Diphtheria

The incubation period of diphtheria may be hours, days, or weeks. The germ is carried from person to person or by clothing, toys, and food. While the most common site

of diphtheria is the tonsil, infants may have the disease in the nose (nasal diphtheria) or larynx (membranous croup). The poison (toxin) produced by this deadly germ acts quickly and makes the disease extremely serious. Cultures taken of any suspicious nasal discharge or patch in the throat aid in early diagnosis. As soon as a diagnosis is made, the patient should receive an ample dose of antitoxin and be placed in quarantine until the cultures are free from the germ. Cultures should be taken of all persons who have come in contact with the patient, and they should not mingle with others until the culture-report shows them to be free from the germ. Some people are "carriers" of this bacillus. Should it be found in culture without visible signs of the disease, a Schick test will aid in determining whether the individual has enough natural antitoxin or whether an injection of antitoxin is necessary. If a person has at any time in the past received antitoxin, or is subject to asthma, great care must be exercised in the administration of antitoxin. Although early diagnosis, antitoxin, and intubation have greatly reduced the mortality due to this treacherous disease, the death rate is still high.

**Prevention of
Diphtheria**

Diphtheria is now a preventable disease. The Schick test detects susceptibles, and three toxin-antitoxin injections (given two weeks apart) confer immunity. It is advisable to have a Schick test made five months after the last toxin-antitoxin injection to prove the existence of immunity. Investigation has shown that the children of the well-to-do are very much more susceptible to diphtheria than are those living in the crowded parts of cities.

**Whooping-
Cough**

Whooping-cough is often a serious disease in infants. One attack usually confers immunity. The most frequent and serious complication is bronchopneumonia. As the germ is short-lived outside the human body, the patient himself is the main source of infection. The contagious period begins during the first stage of the disease. The second stage is called the spasmodic, on account of the characteristic paroxysms of cough which often end with a "whoop." The third period is the decline, during which the coughing spells become less frequent and less severe. The average duration of the disease is about nine weeks. By the aid of blood counts, a diagnosis can often be made days before the first whoop. It is at present customary to give hypodermic injec-

tions of whooping-cough vaccine. The earlier these injections are given, the more benefit seems to be derived from them. It is difficult to determine whether the disease can be prevented by the administration of vaccine before symptoms arise. Patients should be kept warm during cold weather—the temperature of the room ranging from 55° to 68° F., and the air should be kept moist. When frequent vomiting occurs, the quantity of food should be reduced and the number of feedings increased. Thick cereal feedings may prove serviceable.

Chicken-pox, mumps and German measles are usually mild and complications seldom occur. Isolation must be observed.

**Chicken-pox,
Mumps and
German
Measles**

Vaccination with cowpox against smallpox has been practiced in all civilized countries for over a century. It is one of the greatest achievements of medicine. Everyone should be vaccinated at least three times: in infancy, at puberty, and at twenty. When smallpox is prevalent in a community, all who have not been successfully vaccinated within five years should have it done.

Vaccination

The first spring or autumn after the child is four months old is the ideal time for the first vaccination, provided he is well and

free from skin disease. Boys are usually vaccinated on the left arm, girls on the left leg some distance above or below the knee. As no inherited immunity exists, an unsuccessful attempt should be repeated, if necessary, a number of times.

After the vaccination is dry, it is covered with a sterile dressing which is held in place with adhesive plaster, which may be removed the following day. The wound heals and the small blister which appears after a few days increases in size. A red area appears about the blister and the temperature may go above 103° F. The blister then dries and a firm, dark brown or black crust remains for a week or more. When this drops off, a discolored scar remains which becomes pale and somewhat porous. The glands in the arm pit or groin usually enlarge and become tender when the process is at its height (about the 7th to 10th day).

When the blister forms, the area should be covered with stearate of zinc dusting powder and a sterile gauze dressing applied daily. This is held in place by two narrow strips of adhesive. Vaccination "shields" do not permit sufficient drying. No water should touch the area until after the scab has fallen off. If the contents of the blister

TABLE OF INCUBATION* AND ISOLATION PERIODS

DISEASE	INCUBATION	ISOLATION (varies according to local health rules)
Chicken-pox	14 to 21 days	2 or more weeks
Diphtheria	2 to 7 days	Until cultures are negative
German Measles	14 to 21 days	1 to 2 weeks
Infantile Paralysis	2 to 14 days	4 to 8 weeks
Measles	10 to 14 days	2 weeks
Mumps	14 to 21 days	2 weeks
Scarlet Fever	2 to 5 days	4 or more weeks
Whooping-Cough	7 to 21 days	6 or more weeks

*Interval between exposure and first symptom.

ooze, great care must be exercised to avoid infection. Scratching must be avoided, as infection may thus be produced, or the vaccine may be spread to other parts of the body.

CHAPTER VII

CARE OF THE SICK INFANT

The Trained Nurse

The trained nurse who has graduated from a modern children's hospital is often indispensable in case of severe illness or an obstinate condition that requires careful nursing. Her experience and skill give the patient, to a certain extent, many of the advantages of hospital care. Many measures are resorted to in saving infant and child life, and the registered trained nurse is usually well equipped to take her share of responsibility.

Signs and Symptoms

The mother and nurse can aid the physician by recording the patient's condition between visits. The following observations are of value: rectal temperature, taken twice a day if nearly normal, four times a day if fever; respirations, best observed while asleep; disposition, normal, fretful, or drowsy; sleep, sound or restless; appetite; frequency of bowels and urination; nature of the cry, cough or pain; vomiting; belch-

ing of gas; and the condition of the skin, lips, and eyes.

**Examining
the Patient**

Whenever an infant becomes ill it is of the greatest importance to find out as soon as possible whether one or more things are wrong. For the physician to make a thorough examination, it is important that the light be good and the room warm. The infant should be completely undressed so that the physician can examine the skin, lungs, heart, abdomen, legs, arms, spine, and genitals. An extension or drop-light is a great convenience for the ear, nose, and throat examination. A bowel movement and a specimen of urine are essential. The latter should be kept in a cool place in a clean, small, well-corked and labeled bottle.

Thermometer and Fever

**Rectal
Temperature**

The only reliable way to determine an infant's temperature is to take it with a rectal thermometer. After the mercury has been shaken down into the bulb a little vaseline is applied to the bulb end, about an inch of which is then inserted into the rectum and held there for several minutes. After the temperature has been read, the thermometer is cleansed with cotton and alcohol. The normal rectal temperature is

98° to 99.5° F. A rectal temperature of 100° to 101° F. is subfebrile; 101° to 103° F. is mild fever, above 103° F. is high fever. When a high fever has persisted for some time and suddenly drops to normal and does not go up again, we speak of crisis (as in lobar pneumonia); when the decrease is gradual, it is known as lysis (as in typhoid fever), when a febrile temperature goes to normal for several days and then goes up again, it is called an intermittent fever (as in pyelitis.)

Hydrotherapy

Water has been used in the cure of disease since the time of the ancient Greeks and Romans. Water, internally and externally, is a most potent agent in the treatment of children's diseases.

The tepid sponge bath aids in reducing a high body temperature. The child should be undressed in a warm room (70° F. or above), covered with a sheet or blanket, and slowly sponged with tepid water for five to fifteen minutes. The evaporation of the water from the surface of the body reduces the temperature.

The mustard bath is used for collapse, subnormal temperature, and convulsions. Four or more tablespoonfuls of ground mus-

**The Tepid
Sponge Bath**

**Mustard
Bath**

tard are mixed with a little hot water and added to about four gallons of warm water (temperature 105° F.). The child is left in the bath about five minutes, during which time the extremities and trunk should be vigorously rubbed. The child is then wrapped in a warm blanket and placed in the crib.

Cold Douche

The cold douche is resorted to in respiratory failure. While the child is in a warm bath, a pint of cold water is poured over the head and chest.

Hot Pack

The hot pack is used at the onset of a cold. After the child has been placed in a warm bath (105° F.) for three minutes, he is rolled in a warm blanket and allowed to perspire for one hour, a cold compress being applied to the forehead. At the end of this time, he is sponged with tepid water and rubbed with alcohol.

Tepid Pack

The tepid pack is valuable when the temperature stays above 103.5° F. A small sheet which has been dipped in tepid water (75° F.) is wrung out, and the child is wrapped in it from the armpits to the hips or feet and covered lightly with a blanket. If the temperature is still high at the end of four hours, the pack should be renewed.

The mustard pack is of value at the onset of bronchitis. Two or three rounded table-spoonfuls of ground mustard are mixed with ten ounces of hot water. A medium-sized towel is dipped in and wrung out. The chest and back are anointed with oil or vaseline, and the mustard towel is put around the trunk, from the armpits to the hips, and the child is then wrapped in a warm blanket. After fifteen minutes, he is given a warm bath, the temperature of the water being brought up to 105° F. He is then wrapped in a warm, dry blanket and allowed to remain quiet for half an hour, at the end of which time he is sponged with tepid water and rubbed with alcohol or camphorated oil. The skin should redden, but not blister.

**Mustard
Pack**

The turpentine stupe is sometimes used in case of colic. A towel which has been dipped in warm turpentine water (one teaspoonful to the pint) is placed over the anointed abdomen and left there for fifteen to thirty minutes.

**Turpentine
Stupe**

NOTE: ARTIFICIAL RESPIRATION: The room temperature should not be below 65° F. The clothing is removed; the extended arms are slowly brought above the head and then firmly pressed against the chest to expel the air from the lungs. These movements should be synchronous with respirations (about 20 times per minute). The body should be kept warm, and the limbs should be rubbed in the direction of the heart in order to aid circulation.

Stomach Washing and Tube Feeding

Lavage

Washing out the stomach is known as gastric lavage. A small funnel is attached either directly or by means of a small piece of rubber tubing with a glass connection ("window") to a rubber catheter (No. 14 French) ten to sixteen inches long, marked in inches. If the catheter is not graduated, 4, 5, and 6 inches should be marked on it with ink or silver nitrate solution.

Two persons are necessary for the procedure. The arms are included in a tightly wrapped blanket, the head is held rather firmly, and the moistened catheter is slowly introduced. It is passed four to six inches from the gum line, according to the size of the infant. Holding the catheter firmly in place with one hand and lowering the funnel with the other, the stomach contents may be syphoned off. When no more flows off, then 2 to 4 ounces of normal salt or baking-soda solution is poured into the elevated funnel. The latter is again lowered until all the fluid flows out. By pouring the solution from a graduate and collecting the washings in another graduate, overfilling the stomach can be avoided. Lavage

should be repeated until the water returns clear. (Fig. 10.)

Gavage feeding is often resorted to in the early feeding of premature infants. The introduction of the catheter is as by lavage, but it is not necessary to pass the tube be-

Gavage



Fig. 10.—Stomach lavage.

yond three or four inches, as vomiting is less likely to occur if the tube does not enter the stomach.

The amount of food given by gavage should be recorded. If an infant is very weak, care should be observed that the tube is not passed down the windpipe.

Colonic Flushing and Rectal Feeding

Colonic Flushing

Enema

Colonic flushings are helpful for high fever or when the abdomen is distended with gas. A rubber catheter (No. 20 French) is attached to the small hard rubber tip of a fountain syringe outfit and a pint or more of plain or soapy water, salt or baking-soda solution is slowly injected into the rectum. The catheter should be well lubricated and slowly introduced for a distance of four to six inches. To bring down a high body temperature, the enema should be between 90° and 95° F.; otherwise it should be about 100° F. (Fig. 11.)

Rectal Feeding

An appreciable amount of fluid, food and medicine can be absorbed by the lower intestine. This route is used in cases of obstinate vomiting, convulsions, collapse, hemorrhage, etc. The apparatus consists of a small funnel attached to a No. 14 French catheter. One to four ounces are poured into the funnel after the lubricated catheter has been introduced about six inches into the rectum. After the removal of the catheter the buttocks are held together with a strip of adhesive. Such feeding or medication is usually repeated several times a day. In older infants the *slow drop method* is sometimes used. The outfit for this consists

of an enema can, rubber tubing, glass connection ("window"), catheter (No. 14 French), and a thumb screw or clothespin so that the flow can be reduced to about ten drops per minute. The rate must be care-



Fig. 11.—Giving an enema.

fully regulated before the catheter is inserted.

A solution much in use for rectal feeding is known as Ringer's solution. It is made as follows:

Sodium chloride (salt)—2 level teaspoonfuls
Potassium chloride — 7 grains
Calcium chloride — 4 grains
Boiled water — one quart

Collection of Specimens

Chemistry and the microscope have revolutionized the diagnosis of disease. Many diagnoses are today verified by laboratory tests and findings. Urine specimens should be obtained after the vagina or penis has been carefully cleansed with soap and water. The receptacle and bottle must be clean, and specimens should be kept in a cool place until the physician arrives. An infant's urinal, bird-seed dish, or small wide-mouth bottle placed in the proper position inside the napkin facilitates the collection of a specimen. Enough can sometimes be obtained from a pledget of cotton placed at the urinary orifice. A rubber sheet spread beneath the infant after the napkin has been removed will permit urine to collect in a pool which can be scooped up with a spoon. Giving water to drink and applying a warm or cold wet cloth over the lower part of the abdomen may induce urination.

Nose, throat, and ear cultures are incubated at 98° F. for twelve hours before examination. Eye and vaginal smears are made on clean glass slides; sputum specimens should be collected in clean wide-mouth bottles. Stools to be examined for

invisible traces of blood, starch, fat, or worm eggs should be placed in small, tightly closed, labeled jars.

Blood Examination

The normal white blood count of infants may vary between 6,000 and 8,000 per cubic millimeter. It is increased in some diseases (whooping-cough, pneumonia, etc.) and decreased in others (measles, influenza, malaria, and typhoid fever). Hemoglobin determinations are made to detect anemia.

Worms

Intestinal worms are rarely found in infants. Symptoms usually attributed to worms may be due to errors in diet, indigestion, or nervousness, and usually continue in spite of "worm" medication, if the error is not corrected. A small, white thread-like worm is the most common variety found in infants' stools. These worms are sometimes seen between the folds of the vagina, where they may cause itching. Worms which are passed should be sent to the physician for identification so that the proper treatment may be begun. Not infrequently, suspected worms prove to be shreds of orange, paper, or thread.

Accidents

Accidents often occur when medical aid cannot be obtained quickly. A first-aid kit should contain: sterile cotton, gauze and bandages, adhesive plaster, carron oil, peroxide of hydrogen, boric acid, alum and small quantities of tincture of iodine and lysol.

Bumps and Bruises

If a bump begins to swell, it should be pressed with a cold spoon and then a smooth piece of ice or a cold compress should be applied to minimize swelling and discoloration.

Burns

First degree burns are so mild that a blister does not form. Sterile vaseline and a bandage usually suffice. In second degree burns the blister should be opened with a sterilized needle and after all the destroyed skin is carefully removed, carron oil emulsion (equal parts of linseed oil and lime water) or sterile vaseline should be applied very freely on sterile gauze and a bandage applied. Extensive second and all third degree burns must be seen by the physician. They leave more or less permanent scars. Burns due to fireworks necessitate the injection of anti-tetanic serum to prevent lockjaw.

Cuts

If the skin is lacerated or bleeds, the

wound should be washed with peroxide of hydrogen or lysol solution (one teaspoonful to one pint of boiled water), gently dried, and a sterile dressing or adhesive strap applied. If a cut is very deep and blood spurts out, a tight bandage should be applied to prevent loss of blood until the physician arrives. Stitches may be necessary to facilitate healing and decrease scar formation.

If an infant rolls off a bed, falls out of a high chair, or has any other severe fall, he should be placed in a horizontal position, the clothing loosened, and when crying ceases he should be kept quiet for some time. If vomiting occurs or if he cries when an arm or leg is moved or when he sits up, he should be seen by the physician. An x-ray picture may be necessary to detect a fracture or dislocation.

Falls

Concussion of the brain is accompanied by a complete or partial loss of consciousness. In concussion, a cold compress to the head should be frequently changed, and if the feet are cold, heat applied. The child should be kept quiet until the physician arrives.

**Concussion of
the Brain**

If a child inhales stearate of zinc or talcum powder, wipe out the mouth as thoroughly as possible, keep child quiet, and

**Inhaling
Powders**

send for physician. Smelling salts may be of value. Artificial respirations or oxygen are rarely necessary.

Foreign Bodies

In the Eye

By holding the lids apart, one can usually remove particles of dust from the eye with the corner of a clean handkerchief. If this is unsuccessful, the physician should be called. Rubbing must be avoided, as the object becomes more firmly imbedded and the inflammation more intense. A wet dressing of boric acid solution may bring relief until the physician arrives.

In the Ear and Nose

Orange seeds, buttons, safety pins, paper, pebbles, and other objects may be lodged so firmly that great caution must be exercised to prevent pushing the object farther in. If the object cannot be easily removed with tweezers, the child should be taken to the physician without delay. If old enough, the child should blow his nose strongly while the empty nostril is compressed.

Swallowing Objects

Coins, buttons, pins, etc., are not infrequently swallowed. If there is difficulty in breathing, the child should be held with the head down and quite forcibly slapped between the shoulder blades. Should this fail to dislodge the object, the child should

be gagged by pressing at the base of the tongue with a spoon handle. If there is no difficulty in breathing or swallowing, the object has probably reached the stomach and there is usually no need for immediate alarm. Young children should be given the usual food. Older children should be given bread crumbs, potato or cereal. An x-ray is of value if symptoms arise. Swallowing an open safety pin sometimes necessitates operation. Laxatives and emetics should never be given, and all stools should be very carefully examined during the next few days until the swallowed object appears. Some foreign bodies require five or six days to pass through the intestinal canal.

Bones of young children break rather easily. The x-ray reveals many fractures ("green stick" fractures) which might otherwise not be recognized.

**Fractures
(Broken
Bones)**

Nosebleed may be due to an ulcer in the nose. The bleeding can usually be quickly stopped by inserting a pledget of cotton which has been dipped in a solution of alum. The child should be kept quiet in an upright position, and the bleeding nostril compressed until a clot forms (about ten minutes).

Nosebleed

Medicines taken promiscuously may act as

Poisons

poisons. (See Poisons and Antidotes, page 163.)

Splinters

If a sliver enters the flesh it should be completely removed as soon as possible with tweezers or a sterilized needle, after which a wet dressing (one teaspoonful of lysol to a pint of boiled water) should be applied for twenty-four hours.

**Sprains and
Dislocations**

In the case of a sprain or a dislocation, the affected joint swells and is painful when the child is picked up, undressed, or attempts to walk. Medical aid should be sought early.

Poisons and Antidotes

In case of accidental poisoning, one should do as follows:

1. Send for the physician at once, telling him what was taken.

2. When the poison is not an acid or strong caustic, vomiting should be induced. This may be accomplished by pressing down the tongue with a finger or spoon, by giving a teaspoonful or more of ground mustard in water, or by giving Syrup of Ipecac in large doses.

3. The poison should be neutralized as soon as possible.

4. Give 5 to 10 drops of Aromatic Spirits of Ammonia in a tablespoonful of water as a stimulant in case of threatened collapse.

Poison**Antidote**

Acids (acetic, hydrochloric, sulphuric, nitric)	Baking soda, milk of magnesia, soap and water, then olive or sweet oil (no emetic).
carbolic, lysol, etc.	Epsom salts, soap and water (no emetic); externally for burns 50% alcohol.
oxalic	Emetic, then lime water, chalk, or tooth powder and water.
Aconite	Emetic, stimulation.
Alcohol (brandy, whisky, etc.)	Emetic, cold douche, coffee enema; apply external heat, friction.
Alkalies (Ammonia, caustic)	Vinegar, lemonade, then olive oil or sweet oil (no emetic).
Ammonia (see Alkalies)	
Arsenic (Fowler's Solution, Paris Green, Rat Poison, Depilatories)	Emetic, milk or white of eggs, then emetic; give arsenic antidote as soon as possible (fresh mixture of tincture of iron and calcined magnesia); laxatives.
Atropine (see Belladonna)	
Belladonna (Atropine)	Emetic, coffee, cold to head, stimulation.
Bichloride of Mercury (see Mercury)	
Carbolic (see Acid)	
Caustic (see Alkali)	
Corrosive Sublimate (see Mercury)	
Cough Syrups (see Opium)	
Gas (illuminating, coal fumes)	Fresh air, artificial respiration, stimulation, strong coffee by mouth or high enema; warm bath with cold douche.

Hydrochloric Acid (see Acid)	
Iodine	Starch or flour mixed with water or milk, then emetic; stimulation.
Laudanum (see Opium)	
Lye (see Alkali)	
Matches (see Phosphorus)	
Mercury (Bichloride of Mercury, Corrosive Sublimate)	Emetic, then white of egg, milk or one teaspoonful tannic acid in a cup of water.
Morphine (see Opium)	
Nitric Acid (see Acid)	
Nux Vomica	Emetic, then tannic acid solution (one teaspoonful to cup); ten grains bromide of soda.
Opium (cough syrups, laudanum, morphine, paregoric, soothing syrup, etc.)	Emetic, strong coffee, keep awake for twelve to twenty-four hours, cold douche, artificial respirations.
Oxalic Acid (see Acid)	
Paregoric (see Opium)	
Paris Green (see Arsenic)	
Phosphorus (Matches, Rat and Roach Pastes)	Emetic, white of egg, magnesia in large doses; no milk or oil.
Rough on Rats (see Arsenic)	
Silver Nitrate (Lunar Caustic)	Emetic, one teaspoonful of salt to one cup of water, then emetic; milk or white of egg.
Stearate of Zinc	Emetic, then milk or white of egg, followed by an emetic.
Sulphuric Acid (see Acid)	
Tobacco	Emetic, milk, heat and friction of extremities, stimulation.

APPENDIX

NAME			DATE OF BIRTH		
AGE	WEIGHT LBS.	OZ.	GAIN OR LOSS IN OZ.	FOOD	HEALTH REMARKS
At birth					
1st day					
2					
3					
4					
5					
6					
7					
2nd week					
3rd “					
4					
5					
6					
7					
8th (2 mo.)					
9					
10					
11					
12					
13 (3 mo.)					
14					
15					
16					
17 (4 mo.)					
18					
19					
20					
21					
22 (5 mo.)					

AGE	NAME		DATE OF BIRTH		
	WEIGHT LBS.	OZ.	GAIN OR LOSS IN OZ.	FOOD	HEALTH REMARKS
23					
24					
25					
26 (6 mo.)					
27th week					
28					
29					
30 (7 mo.)					
31					
32					
33					
34 (8 mo.)					
35					
36					
37					
38					
39					
40 (9 mo.)					
41					
42					
43					
44 (10 mo.)					
45					
46					
47					
48 (11 mo.)					
49					
50					
51					
52 (1 yr.)					

Table of Approximate Weight and Height

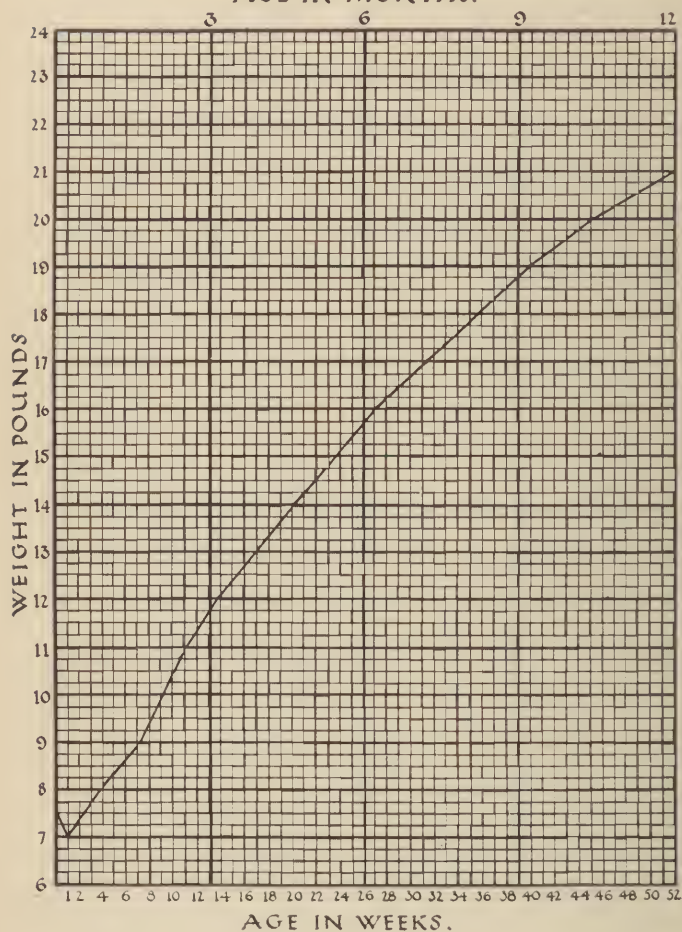
(The figures after one year are based on the Table of the Children's Bureau, U. S. Dept. of Labor.)

YEARS	AGE	MONTHS	DATE	AVERAGE HEIGHT IN INCHES	HEIGHT	AVERAGE WEIGHT		WEIGHT
						LBS.	OZ.	
Birth				20		7	1	
		1		20½		8	4	
		2		21		10	8	
		3		22		12	4	
		4		23		13	8	
		5		24		15		
		6		25		16		
		7		25½		17		
		8		26		18		
		9		26½		19		
		10		27		19	8	
		11		27½		20		

1 year		28	20	8
14		29½	21	10
16		30½	22	10
18		31	23	6
20		32	24	2
22		32½	25	4
	2 years	33	26	6
2½		34½	27	12
2⅞		35	29	
3 years		36	30	8
3⅓		37½	32	
3⅝		38½	33	
4 years		39	33	12
5		41½	41	
6		43	45	
7		45½	49	
8		47½	54	
9		49½	59	
10		52	65	

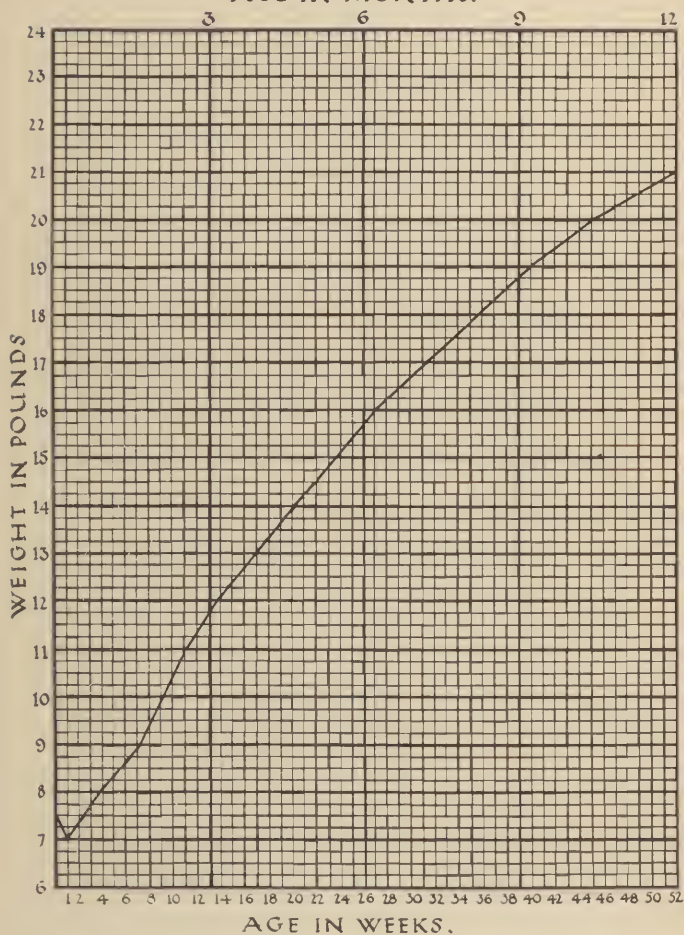
WEIGHT CHART OF _____ BORN _____

AGE IN MONTHS.



WEIGHT CHART OF _____ BORN _____

AGE IN MONTHS.



Eventful Dates:

Sat up alone
First tooth
Stood alone
Walked alone
First Words
First Sentence

MEMORANDUM

MEMORANDUM

MEMORANDUM

MEMORANDUM

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